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ABSTRACT

To assess whether verbal perseverations were used with communicative intent, 15 persons with autism (9-26 years old) were observed throughout four composite school or work days. Data were collected using an event-sampling procedure, with utterances coded according to function, setting, and response of listeners. Among results were that approximately 17% of the total number of utterances observed were verbal perseverations; and the majority of all utterances were used with communicative intent; that all utterances occurred most often in work settings, followed in order by transition and free time; and that the most common response to all utterances was neutral in nature, followed by no response. (CL)

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UNIVERSITY OF CALIFORNIA

Los Angeles

Observational Study of the Use of Verbal Perseverations by Persons With Autism

A dissertation submitted in partial
satisfaction of the requirements for
the degree of Doctor of Philosophy in
Special Education, CSULA-UCLA

by

RaeLynne Pellinger Rein

1984

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CERTIFICATION: I certify that to the best of my knowledge and belief this report (consisting of this and subsequent pages and attachments) is correct and complete in all respects, except as may be specifically noted herein.

Typed Name of Project Director(s) or Principal Investigator(s): Antoinette Krupski/RaeLynne P. Rein	Signature of Project Director(s) or Principal Investigator(s): RaeLynne P. Rein

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ABSTRACT OF THE DISSERTATION

Observational Study of the Use of Verbal Perseverations by Persons With Autism

by

RaeLynne Pellinger Rein
Doctor of Philosophy in Special Education,
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University of California, Los Angeles, 1984
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A subgroup of persons with autism manifests excessive verbal perseverations pertaining to a particular topic of interest. The primary purpose of this study was to assess whether such utterances are used with communicative intent, and if so, with what types of communicative intent are they used. A secondary purpose was to collect information pertaining to the parameters surrounding the occurrence of verbal perseverations.

Participants were 15 persons with autism, ages 9.1 to 26.0 years, each having a particular circumscribed interest pattern and displaying high amounts of verbal perseverations. Participants were observed throughout four composite school or work days while they followed their daily school or work routines. Data were collected using an event-sampling procedure. Each utterance was coded as to whether or not it was a verbal perseveration, its function, the setting in which it occurred, and the response of the listener.

There were several major findings. First, approximately 17% of the total number of utterances observed were verbal perseverations.

Secondly, the majority of all utterances were judged to be used with communicative intent. Verbal perseverations tended to be used for social interaction. Utterances that were not verbal perseverations on the other hand, were used primarily for information.

Thirdly, all utterances occurred most often in work settings, followed in order by transition and free-time. However, when comparing the mean percentages of occurrence, utterances that were not verbal perseverations were more likely to occur during work than were verbal perseverations.

Finally, it was found that the most common response to all utterances was neutral in nature, followed by no response. When comparing the mean percentages of occurrence, verbal perseverations were more likely to be given a no response, while utterances that were not

verbal perseverations were more apt to be responded to neutrally.

These findings indicate that verbal perseverations tend to be used with communicative intent, primarily for social interaction. Such findings suggest that for some individuals verbal perseverations may be viewed as purposeful and goal-directed behavior to be further explored, rather than as negative behavior to be discouraged.

CHAPTER 1

REVIEW OF LITERATURE

Statement of Problem

A subgroup of persons with autism talks excessively about a particular topic of interest. Since there is no established label found in the literature for such talking, the term verbal perseverations is used to refer to these verbal utterances.

The manner in which verbal perseverations are interpreted is important since different interpretations lead to varying directions for intervention. For example, a traditional approach has been to view verbal perseverations as inappropriate and without any useful social function, leading to educational practices aimed at decreasing or eliminating such behavior.

An alternative view is that verbal perseverations may serve a socially useful purpose. This was the hypothesis explored in this study. It was suggested that such behavior may be used by the person with autism as a means of initiating and/or maintaining a social interaction. Educational practices following from this position would not have the primary aim of decreasing or eliminating verbal perseverations, per se. Rather the objective of educational intervention may be to modify the behavior in order to enhance its positive social function, while decreasing the negative manner in which it is manifested.

The purpose of this study, therefore, was to assess whether verbal perseverations in persons with autism have any potential social utility. Specifically, this study was an examination of the extent to which such behavior is used with communicative intent and the types of communicative intent with which it is used.

Background Information

Introduction

Persons with autism are handicapped individuals who require special education services because of severe language, social and cognitive impairments (Bartak, 1978; Oppenheim, 1974). Of these impairments, difficulty in processing and using language is considered to be the underlying basis for the syndrome of autism (Ricks & Wing, 1975). Although there is no commonly accepted profile of language functioning in persons with autism (Baker, Cantwell, Rutter, & Bartak, 1976), certain features are repeatedly described in the literature. Such descriptions usually focus on children as opposed to adolescents and adults. For example, it is generally acknowledged that approximately half of children with autism fail to develop functional speech (Ricks & Wing, 1975; Rutter, 1978). According to Ricks & Wing (1975), those children who do gain useful speech manifest one or more of a number of abnormalities, such as echolalia, comprehension difficulties; stereotyped repetition of utterances; delay in acquiring proper word order and grammatical structures; difficulty in using language for communication purposes; inability to understand and utilize nonverbal aspects of language such as facial expressions, gestures, and body posture; and difficulty in using language flexibly and creatively.

Far less is known about the language of adolescents and adults with autism. It is acknowledged that while language disabilities commonly persist as the individual matures, for a subgroup of persons, such disabilities decrease with age (Rutter, 1978). Common types of language disturbances manifested later in life described by Lord and O'Neill (1983) include language performance below that of cognitive ability and age; comprehension difficulties; limited vocabularies; impairment in the understanding and use of nonverbal social aspects of language; continued, yet decreased, echolalia; and excessive talking about particular themes or topics.

Another primary characteristic of persons with autism, and one closely tied to the language disability (Lord & O'Neill, 1983; Ricks & Wing, 1975) is the difficulty in developing social relationships (Coleman, 1976; Kanner, 1943; Rutter, 1978). Many investigators have described the unique social problems observed in children with autism during the first five years of life. Several of the behavioral features most often cited are: little evidence of attachment behavior and parental bonding (Rutter, 1978); failure to raise arms in an anticipatory gesture when being picked up (Schopler, 1978; Rutter, 1978); absence, arrest or delay in emotional responses (Schopler, 1978; Ricks and Wing, 1975); and lack of cooperative play and the development of friendships (Schopler, 1978; Rutter, 1978).

Although many of the social impairments improve as the individual with autism matures, serious difficulties remain throughout life. According to Rutter (1978), the types of problems most often seen in later childhood and adolescence are lack of cooperative group play, failure to make peer friendships, and inability to empathize and understand verbal and nonverbal social messages. Despite these difficulties, it is estimated that approximately 25% of children with autism begin to demonstrate a desire and willingness to relate socially to others as they mature (Wing, 1978). Data such as these have led some investigators to hypothesize that a subgroup of individuals with autism are motivated to develop social relationships, but they lack the necessary knowledge and skills to do so (e.g., Dewey & Everard, 1974; Mesibov, 1983; Ricks & Wing, 1975; Rutter, 1970).

A third major characteristic of persons with autism is maintenance of sameness behavior (Clancy, Dugdale, & Rendle-Short, 1969; Coleman, 1976; Prior & MacMillan, 1973; Rimland, 1964). Such behavior refers to an intense resistance to change and a striving to preserve sameness in the environment (Creak, 1961). Although there are no universally acknowledged criteria, there is a general acceptance of the types of behaviors considered indicative of "sameness behavior." Such behaviors include resistance to change (Wing, 1972), extreme attachment to objects (Marchant, Howlin, Yule, & Rutter, 1974), resistance to new learning (Wing, 1972), obsessive/compulsive behavior (Simons, 1974), and circumscribed interest patterns (Kanner, 1954). Little is known about such behaviors, in spite of the fact that they are considered to be a serious (Wing, 1972) and persistent problem (Kanner, 1971).

Given the extent of their language, behavioral, and social impairments coupled with apparent increases in attempts to interact with others, it is important that the language and behavior patterns and social interactions engaged in by such individuals be examined. One type of behavior that overlaps the language, behavioral, and social functioning of a subgroup of persons with autism is verbal perseverations dealing with circumscribed interest patterns. Available literature on this behavior will now be examined.

Circumscribed Interest Patterns and Verbal Perseverations

Special interests that are markedly restricted to specific topics of information are referred to in the literature as circumscribed interest patterns (Robinson & Vitale, 1954). Although any topic may be targeted, common examples of such interests are bus schedules, maps, calendars and watches (Kanner, 1949). Circumscribed interest patterns have been observed in subgroups of nonhandicapped, obsessive/compulsive, schizophrenic and autistic persons (Kanner, 1954).

When seen in nonhandicapped children, circumscribed interest patterns are often a positive and desirable aspect of the child's personality manifested in the form of a special skill or talent. Such children usually use that skill or inclination in a socially acceptable and constructive manner. Their talents often lead to respected career choices, such as an early predilection toward the piano leading to a career as a pianist. Other times the interests are gradually phased out as the child matures. The crucial point, however, is that they do not seriously interfere with the day-to-day functioning of the nonhandicapped child.

Conversely, with most handicapped and a small group of otherwise nonhandicapped children, circumscribed interest patterns appear to seriously interfere with the normal functioning of the individual. Such interest patterns result in the ignoring of other areas not related to the particular topic of interest. This concentration of effort on one area of interest often leads to a severe restriction of interpersonal relationship development with family and peers (Robinson & Vitale, 1954).

Circumscribed interest patterns do not represent a special skill or talent, as seen in the rare "idiot savant phenomenon" (Prior, 1979). Instead, what is most often seen is frequent naming, listing and uncreative questioning pertaining to the particular interest, usually to the annoyance of others (Kanner, 1954). Since there is no commonly accepted label for this type of talking, the term verbal perseverations is used to refer to such utterances. This type of verbal behavior is differentiated from other forms of atypical language patterns. For example, one rare type of peculiar verbal behavior found in persons with schizophrenia in a deteriorated stage is "word salad", in which groups of words are uttered with no apparent meaning (Maher, 1966). Another atypical type of verbal behavior found in persons with schizophrenia is repetitiousness, in which words or phrases are repeated in a particular order (B.A. Maher, personal communication, May 1984). The feature that separates verbal perseverations, however, from these other types of unusual language patterns is the fact that verbal perseverations relate to a particular theme or topic. In other words, verbal perseverations are unique in that the content of the utterance is the important feature, as opposed to the form.

Although limited empirical data are available concerning verbal perseverations in persons with autism, such behavior is frequently mentioned in the literature. For example, verbal perseverations dealing with circumscribed interest patterns have been noted in a follow-up study by DeMyer, Barton, DeMyer, Norton, Allen, and Steele (1973). These investigators examined 85 boys and 35 girls with autism, mean age 5-1/2 years at initial evaluation and 12 years at follow-up. It was found that the speech of a subgroup of children improved as they matured. However, problems remained, including conversing in an unusual manner by obsessing over a particular topic. This is in agreement with the observation by Rutter (1970) that many autistic adolescents, and some adults, converse by repeating obsessive questions pertaining to a particular topic of interest.

In fact, circumscribed interest patterns have been found to be especially troublesome when observed in a subgroup of verbal persons with autism (Mesibov & Shea, 1980; Robinson & Vitale, 1954). Unusual, sometimes bizarre, topics of interest are developed and manifested by excessive verbal perseverations pertaining to the particular topic of interest (Lord & O'Neill, 1983; Mesibov, 1983). While such perseverations are sometimes muttered to oneself, many times they are intentionally directed toward another person (Rutter, 1970; Wing, 1983). An example would be the individual who is obsessed with shoes and frequently asks, "Where did you buy your shoes?" or says, "This is my favorite pair of shoes.", regardless of the topic of conversation in progress.

A traditionally accepted notion is that verbal perseverations are inappropriate and undesirable (Dewey & Everard, 1974; Kanner, 1954). In fact, empirical data are available (Mesibov & Shea, 1980) which demonstrate that such behavior is perceived as a major problem by caretakers of adolescents and adults with autism in residential settings. According to the investigators, this type of constant inappropriate talking is extremely irritating to the caretakers, in part because it "wears down" the listener due to extra pressure and stress.

In summary, evidence exists which identifies verbal perseverations pertaining to a particular circumscribed interest pattern as a relatively common behavior manifested in a subgroup of individuals with autism. Such behavior is generally considered to be inappropriate and undesirable.

Communicative Intent

Verbal perseverations in persons with autism have long been assumed to be inappropriate (e.g., Kanner, 1949; Wing, 1983). Contrary to this viewpoint, it can be suggested that verbal perseverations may be used communicatively by persons with autism. Although direct evidence is not available, a recent body of research dealing with the functional use of other aspects of language in persons with autism indirectly supports this line of reasoning.

For example, Oxman and Blake (1980) examined the communicative functions of signing in seven children and adolescents with autism and three children and adolescents with autistic characteristics, ages 6.7 to 14.10 (mean 11.9). Using transcripts made from videotaped play sessions, observers coded and classified the signing emitted by participants according to its communicative intent. Classification of the signing was based on Halliday's (1975) socio-linguistic categories. Results indicated that half of the signing was judged to be imitative in nature, with 35% of imitative signing judged to be used for the purpose of maintaining a social interaction. On the other hand, the majority of non-imitative signing was judged to be used for information purposes. These findings suggest that the language of persons with autism, in this case imitative as well as non-imitative signing, is used with a variety of identifiable functions, including communication.

In a second study by Hurtig, Ensrud, and Tomblin (1982) the communicative functions of questions were investigated in children with autism who had histories of frequent question production. Participants were five boys, ages 5.7 - 12.2 (mean 9.6). Each participant was observed in a play environment on two separate occasions, two hours each. Every time a participant asked a question, the experimenter used one of four different responses. Responses included: (1) providing information asked for, (2) providing information asked for and providing new information, (3) providing information asked for and asking participant a question on the same topic, and (4) not answering question but instead requesting participant to answer question. The latter 3 responses were found to lead to more topically appropriate continuation by the participants, while merely providing the information requested resulted in significantly less appropriate continuation.

By manipulating listener response, therefore, Hurtig, et al. (1982) were able to demonstrate that verbal children with autism appear to ask excessive questions not to gain information, but rather to initiate or maintain a conversation. The use of questioning for such social purposes is commonly found in nonhandicapped adults, and to a greater degree, in young children. What is noteworthy is that it occurs with higher frequency in persons with autism (Hurtig, et al., 1982). The investigators suggest that persons with autism who use excessive questions, like young nonhandicapped children, lack normal conversational competence, and hence resort to questions as a way of maintaining contact with other persons. Furthermore, these investigators point out that the inappropriate use of a particular type of utterance is not necessarily indicative of the lack of communication intended by the speaker, but rather could be viewed as "a breakdown in some other component of the complex chain representing communicative behavior" (p. 59). They argue that to understand the inappropriate use of an utterance, it is essential to analyze the speaker's communicative intentions.

In a similar vein, a third group of studies has been reported which has as its focus the functional use of echolalia, a behavior traditionally considered to be undesirable when manifested by persons with autism. Although the term echolalia is ill-defined and loosely used in the literature (Schuler, 1979), it commonly refers to the repetition of other people's utterances. Such repetitions are labeled immediate echolalia when they immediately follow the model utterance. When a period of time has elapsed following the model utterance, such repetitions are labeled delayed echolalia. (Simon, 1975).

One study in which the functions of immediate echolalia were examined was conducted by Prizant and Duchan (1981). Language samples of the immediate echolalia of four boys with autism, ages 4.8 to 9.3, were collected on videotapes. Based on behavioral and linguistic features, echolalic utterances were judged to be used with seven different functions. Three of the identified functions were not directed toward another person. Thirty-one percent of the echolalic utterances observed fell into this category. These functions were self-regulation (13%), rehearsal (14%), and non-focused (4%). The remaining four identified functions were directed toward another person. Sixty-nine percent of the echolalic utterances observed fell into this category. These functions were labeled declarative (26%), turn-taking (33%), yes-answer (5%), and request (5%). The findings of this study indicate that immediate echolalia is not a meaningless behavior; rather it is a purposeful, and oftentimes communicative behavior, which is directed toward another person the majority of the time.

Likewise, using a similar procedure as above, Prizant and Rydell (1981) identified 14 functional categories in an examination of the functions of delayed echolalia in one child and two adolescents with autism. Nine of the identified functions, comprising 76% of the echolalic utterances observed, were judged to be interactive. These functions were turn-taking (27%), verbal completion (1%), providing information (10%), labeling-interactive (18%), protest (4%), request (10%), calling (1%), affirmation (2%), and directive (4%). The remaining five functions, comprising 24% of the echolalic utterances observed, were judged to be non-interactive. These functions were non-focused (4%), situation association (14%), self-directive (5%), rehearsal (1%), and labeling-non-interactive (<1%). The findings of this study indicate that delayed echolalia, as with immediate echolalia, is a purposeful and oftentimes communicative behavior usually directed toward another person. Based on the findings from both studies, the investigators warned against indiscriminate attempts at extinction of such behavior and encouraged a functional perspective when viewing immediate and delayed echolalia.

Furthermore, in a more recent study (Prizant & Doughty, in preparation, cited in Prizant, 1982), the imitative routines of high-functioning adolescents with autism were analyzed. The term "imitative routines" was used to refer to those routines which were repetitious in form, such as repeating a jingle or a particular string of words (B.M. Prizant, personal communication, May 1984). Although neither data nor methodology was provided, it was reported that findings suggested that such routines were used by these individuals as attempts to engage in ongoing conversation, especially when unable to comprehend the language directed to them. This suggests that an apparently inappropriate verbal behavior of persons with autism may be used as a conversational tool by the speaker.

To summarize, four groups of studies pertaining to language functioning of persons with autism were reviewed. The first demonstrated that the majority of imitative signing was used for the purpose of maintaining a social interaction, while the majority of non-imitative signing was used for information purposes (Oxman & Blake, 1980). In the second, Hurtig, et al., (1982) found that excessive questioning was used not to gain information, but rather to initiate or maintain a conversation. The third demonstrated that immediate echolalia (Prizant & Duchan, 1981) and delayed echolalia (Prizant & Rydell, 1981) were used with a variety of functions, the majority of which were interactive in nature. Lastly, Prizant and Doughty (in preparation) found that imitative routines were used as attempts to engage in ongoing conversation.

A conclusion that can be reached from these findings is that several language patterns traditionally considered to be undesirable and without communicative intent have been judged to be used communicatively by persons with autism. This is congruent with the contemporary notion that many atypical behaviors manifested by persons with autism are purposeful and may be an attempt at communication (Silverman, 1982).

The findings from the above body of research have led this investigator to question the functions of verbal perseverations, another atypical language pattern manifested in persons with autism, and to examine whether or not such utterances are used communicatively. The lack of appropriate conversational skills has been mentioned often (e.g. Hurtig, et al., 1982; Ricks & Wing, 1975) as a characteristic of verbal persons with autism. One of the reasons for this may be that there is a limited repertoire of utterances available to the person with autism. If such is the case, then verbal perseverations may be one of the few utterance types readily accessible to the verbal person with autism who has a circumscribed interest pattern. As such, verbal perseverations may be the only means, or the most comfortable means, available to some persons with autism to enter into conversational discourse with others.

Therefore, it is possible that verbal perseverations, like questions and imitative routines, may be used by the person with autism to initiate and maintain conversation.

If this is true, then it may be that the purpose underlying the use of verbal perseverations is socially positive, and in fact desirable, even though the utterance may superficially appear to be inappropriate and without any communicative intent. In light of this argument, it is important to examine the potential communicative intent of verbal perseverations, especially their possible use as a conversational tool.

Clearly, communicative intent is a difficult variable to identify. However, recent research by Hurtig, et al. (1982) regarding communicative functions of question production; Oxman and Blake (1980) regarding sign language use; Prizant and Rydell (1981) regarding the functions of delayed echolalia; and Prizant and Duchan (1981) regarding the functions of immediate echolalia, suggest that the communicative intentions of persons with autism can be reliably inferred. Thus, although the question of whether verbal perseverations are used with communicative intent is complex, and one that no single study can answer, it is important to begin to explore this issue.

In summary, evidence exists which identifies verbal perseverations pertaining to a particular topic of interest as a relatively common behavior manifested by a subgroup of individuals with autism. Such behavior has traditionally been considered as inappropriate and undesirable. In contrast to this view, however, it seems plausible that verbal perseverations may be used with communicative intent by the person with autism. In particular, such talking may be used to initiate and maintain social interactions.

Purpose

This investigation was designed to assess whether there is an intended social purpose underlying the use of verbal perseverations in persons with autism. Specifically, this study was an examination of the extent to which such behavior is used with communicative intent, and when used communicatively, the types of communicative intent with which it is used. It was predicted that a proportion of verbal perseverations would be used with communicative intent. A language scale, based on the socio-linguistic categories of Halliday (1975) was used in this study. (See Appendix A for Halliday's categories.) Utterances were categorized as used either with or without communicative intent. Utterances directed toward another person were deemed to be used with communicative intent, while all other utterances were deemed to be used without apparent communicative intent (MacKay, 1972). Furthermore, utterances were examined to determine with what types of communicative intent they were used. In addition, comparative data on utterances that were not verbal perseverations were collected, providing information on whether verbal perseverations differ from other utterances with respect to their communicative intent.

Because little is known about verbal perseverations, the circumstances surrounding the occurrence of such behavior were also recorded. First, those situations in which verbal perseverations were most likely to occur were identified (e.g. teacher-assigned work period, transition between periods, etc.) and compared with those situations in which other types of utterances occurred.

Secondly, listener response was recorded. Such data documented the types of listener responses following verbal perseverations and were examined to determine whether such responses differ from those following utterances that were not verbal perseverations. Since verbal perseverations are generally considered undesirable and inappropriate, it was expected that verbal perseverations would be given a high proportion of negative and/or no responses.

Two major areas of focus guided this study. First, the issue of communicative intent and function was examined, dealing with the following questions:

(1) a - When verbal perseverations occur, what is the extent to which they are used with communicative intent?

b - How does this compare to utterances that are not verbal perseverations?

(2) a - When verbal perseverations are used with communicative intent, with what types of communicative intent are they apparently used?

b - How does this compare to utterances that are not verbal perseverations?

Secondly, the parameters surrounding the occurrence of verbal perseverations were examined, dealing with the following questions:

(3) a - In what settings do verbal perseverations occur?

b - Do the settings in which verbal perseverations occur differ from those in which utterances that are not verbal perseverations occur?

(4) a - How does the listener respond to verbal perseverations?

b - Does the listener respond to verbal perseverations differently than to utterances that are not verbal perseverations?

CHAPTER II

METHOD

Subjects

Participants were fifteen individuals, 13 males and 2 females, who met the following criteria:

(1) Individuals given a diagnosis of autism by the school system or work organization which they were attending;

(2) Individuals, as verified by the investigator, manifesting the characteristics of autism described by Rutter (1978) as:

- (a) Onset of symptoms before the age of 30 months,
- (b) Impaired social development,
- (c) Delayed and deviant language development, and
- (d) Insistence on sameness; and

(3) Individuals identified by their teachers or work supervisors as:

- (a) Having a particular circumscribed interest pattern, and
- (b) Displaying high amounts of verbal perseverations dealing with their unique interest patterns.

Participants ranged in age from 9.1 to 26.0 with a mean chronological age of 18.0 years. Descriptive data for the participants are reported in Table 1.

In order to initially locate participants, this investigator visited secondary and post-secondary programs (school, vocational and residential) for persons with autism in the area. In the process, referrals for potential participants found in other programs were made by parents and teachers. Final selection of the participants depended on verification by the investigator that each participant did, in fact, utter verbal perseverations dealing with a particular circumscribed interest pattern. (See Appendix B for language samples.) Furthermore, each participant manifested such utterances at least 8 times within a 3 hour period in order to qualify for this study.

In addition, parental permission was obtained for all participants selected for this study. No permission that was requested was denied.

Environments

Observations took place in three types of environments. Three participants were observed in a workshop designed specifically for adults with autism. Eleven participants were observed in secondary classrooms for adolescents with autism in public schools. Three of

Table 1

Sex, Age, Diagnosis, and Interest Pattern(s) of Participants

Subject	Sex	Age (years)	Diagnosis	Interest Pattern(s)
1	M	13.0	Tuberous Sclerosis with Autism	Cars, primarily BMW's.
2	M	19.1	Autism	Cartoons and fantasy figures.
3	M	20.1	Autism	Things that will kill you.
4	M	18.4	Autism	(A) Bathroom; (B) Sitting down.
5	F	13.5	Cerebral Palsy with Autism	Quality of her behavior.
6	M	20.0	Autism with STD*	(A) Church things; (B) Pythons
7	M	26.7	Autism	Numbers, primarily dates.
8	M	9.1	Autism	(A) Favorite foods; (B) Spelling words.
9	M	25.9	Autism	(A) Diet, nutrition; (B) Music.
10	F	20.6	Autism, Residual State, with STD*	(A) Them vs Me; (B) Science Fiction.
11	M	14.6	Autism	(A) Freeways; (B) TV shows.
12	M	17.6	Autism	(A) Freeways; (B) TV shows.
13	M	20.7	Autism	(A) Music; (B) Birthdates.
14	M	16.6	Autism with STD*	(A) Girls; (B) Smoking.
15	M	14.1	Autism	Mr. Woods, water heaters.

Note. * Schizophrenic Thought Disorder

A and B refer to two distinct interest patterns.

Mean age was 18.0; median age was 18.4.

these individuals were also involved in some level of mainstreaming into regular education classrooms. One participant was observed in a public school elementary classroom for children with autism. More detailed descriptions of settings may be found in Appendix B.

Participants were observed throughout the school or work day while they engaged in a variety of activities. Although most observations occurred within the classroom or work area, other environments included playground, lunchroom, etc. Those situations or activities in which it was inappropriate to observe the participants (e.g. restroom) were excluded.

Procedure

Data were collected using an event-sampling procedure. This was defined as continuous measurement of every occurrence of codable behavior recorded during the observation period (Wright, 1967). Trained observers were used to record the behavioral events, which consisted of all verbal utterances made by each participant. Each utterance was coded along four dimensions: whether or not the utterance was a verbal perseveration, the type of setting in which it occurred, the apparent communicative intent, if any, with which it was used, and the response of the listener. (See Table 2 for list of categories and Table 3 for definitions of

Table 2

Variables Observed

1. Type of Utterance:	Unintelligible		
	Verbal Perseveration		
	Not Verbal Perseveration		
2. Type of Setting:	Teacher Assigned Work Period		
	Free-Choice Period		
	Transition Time Between Periods		
	Snack/Lunchtime		
	Other		
3. Type of Function:	Initiation		
		Non-Person-Oriented	
		Person-Oriented	
			Interactive
			Informative
			Regulative
			Other
	Response		
		Non-Person-Oriented	
		Person-Oriented	
			Interactive
			Informative
			Regulative
			Other
4. Response of Listener:	Positive		
	Negative		
	Neutral		
	No response		

Table 3

Definitions of Terms

I. Type of Utterance*:

A. Unintelligible - Verbal utterance which is heard, but not understood, by the observer. (Example: Observer hears something said but cannot make out the words, therefore is unable to further code the utterance).

B. Verbal Perseveration - Verbal utterance which contains a word/phrase which directly pertains to the speaker's identified circumscribed interest pattern. (Example: The speaker's interest has been identified as freeways. Speaker says, "I like Highway 99.") Also, verbal utterance which is clearly related to the interest pattern based upon either the context of the utterance or the body language of the speaker, depending on which is the more salient. (Example: Teacher asks student, "Is Highway 99 a good freeway?" Student replies, "Yeah, it's the best one.")

C. Not Verbal Perseverations - Verbal utterance which does not contain a word/phrase which directly pertains to speaker's identified circumscribed interest pattern and is not related to the interest pattern based upon context or the body language of the speaker. (Example: The above speaker says, "I like candy.")

II. Type of Setting:

A. Teacher-Assigned Work Period - Objectives of the task are explicitly presented to the student by the teacher and little deviation from these objectives is permitted. (Example: Student is involved in an activity determined by the teacher, such as working at desk on assigned math workbook lesson, or molding clay during assigned art lesson.)

(table continues)

B. Free-Choice Period - Objectives of the task are not given to the student by the teacher, and student is given a marked amount of choice in determining those objectives. (Example: Student is allowed to decide what to do using available materials, such as looking at a magazine during "free-time".)

C. Transition Time Between Periods - No task objectives are in effect at the moment. (Example: Student is waiting to receive directions concerning next assigned activity, or has completed an activity at one table and is walking to another table to begin another activity.)

D. Snack/Lunchtime - Objective at the moment is to eat snack or lunch. (Example: Student is in the process of eating food during designated snacktime.)

E. Other - Appropriate categorization of the setting is unclear to the observer, or none of the above conditions applies.

XX. Atypical Antecedent - If event has occurred immediately preceeding the verbal utterance, event is described in comment section in addition to coding the setting as usual. (Examples: Student drops tray during lunchtime. Peer hits student during free-choice. Student cuts hand on tool during work period.)

III. Type of Function:

A. Initiation - A verbal utterance which does not follow directly from another person's verbal utterance, but is originated by the speaker.

1. Non-Person-Oriented - Utterance is not directed toward another person, evidenced by lack of directive body language, such as eye contact, leaning of the speaker's body toward the listener, etc. (Example: Student looks at ceiling and says aloud, "Do you like Highway 99?") Also, utterance which appears to be "accidently" directed toward another person, and appears to have no communicative intent

(table continues)

because of the body language of the speaker and/or the content of the utterance. (Example: While glancing at teacher demonstrating a work task, Joey whispers, "Joey, get to bed now.")

2. Person-Oriented - Utterance is directed toward another person, evidenced by content or directive body language.

   a. Interactional - Utterance appears to be used primarily to initiate or maintain a social interaction and not used primarily to give or get information, to regulate another's behavior, etc. (Example: "Your sweater is pretty.")

      (From Levine, 1977)

   b. Informative - Utterance appears to be used primarily to give or get information. (Example: "What time is lunch?")

   c. Regulative - Utterance appears to be used primarily to regulate another's behavior. (Example: "Move out of the way.")

   d. Other - Utterance appears to be used primarily for purpose other than to initiate or maintain a social interaction, to give or get information, or to regulate another's behavior.

B. Response - A verbal utterance which directly results from another person's initiation (within 5 seconds).

   1. Non-Person-Oriented - Utterance is not directed toward another person, evidenced by lack of directive body language, such as eye contact, leaning of the speaker's body toward the listener, etc. (Example: Teacher says "Open your book." Student looks at the table and says,

(table continues)

"The table is brown.") Also, utterance which appears to be "accidently" directed toward another person, and appears to have no communicative intent because of the body language of the speaker and/or the context of the utterance. (Example: Teacher says, "How old are you?" Student glances around room, including at teacher, and says, "The table is brown.")

2. Person-Oriented - Utterance is directed toward another person, evidenced by content or directive body language.

   a. Interactional - Utterance appears to be used primarily to maintain a social interaction and not used primarily to give or get information, to regulate another's behavior, etc. (Example: Teacher says, "Some TV shows are good to watch." Student says, "Yeah, and I love to watch 'Dukes of Hazzard'. It's so funny.")

   b. Informative - Utterance appears to be used primarily to give or get information. (Example: Teacher says, "Did you do your homework?" Student replies, "Yeah, but I left it at home.")

   c. Regulative - Utterance appears to be used primarily to regulate another's behavior. (Example: Teacher says, "Did you do your homework?" Student replies, "Leave me alone.")

   d. Other - Utterance appears to be used primarily for purpose other than to maintain a social interaction, to give or get information, or to regulate another's behavior.

(table continues)

IV. Response of Listener:

A. Positive - Immediate response of listener to verbal utterance is clearly positive in nature. (Examples: Teacher says, "Good talking!" Peer pats student on back and smiles.)

B. Negative - Immediate response of listener to verbal utterance is clearly negative in nature. (Examples: Peer pushes student. Teacher says, "No talking.")

C. Neutral - Immediate response of listener to verbal utterance is neither clearly positive nor clearly negative in nature. (Example: Student says, "Do you like Highway 99?" Teacher says, "I don't know. Line up for lunch.")

D. No Response - There is no immediate response (within 5 seconds) of listener to verbal utterance. (Example: Student says, "Do you like Highway 99?" Teacher says nothing.)

* Utterance - One or more spoken words are separated from one or more other spoken words by a pause of at least 2 seconds.

terms.) Each category was designed to be mutually exclusive and exhaustive. (See Appendix A for an example of the coding scale.)

Data for each participant covered four complete school or work days. Because of observer fatigue and the possibility of extraneous participant variables, such as illness or fatigue, which could greatly affect a participant's behavior during any given day, data were collected over four composite days (Levine, 1977). For example, if the school day began at 9:00 AM and ended at 3:00 PM, participants were observed from 9:00 AM to 11:00 on Day 1, 11:00 to 1:00 on Day 2, and 1:00 to 3:00 on Day 3. This comprised one composite day. Days in which data were collected were not necessarily consecutive. This process was repeated three times to comprise four composite days of data collection over a maximum two month period. No more than 2 observers worked in a classroom or work area at the same time in order to avoid overcrowding.

Observations were made without manipulation on the part of the observers. Each observer followed a target participant as inconspicuously as possible as the participant moved through his/her daily school or work routine. The observer attempted to stay close enough to the participant to see and hear him/her. If a participant talked to an observer, the observer either looked away or directed the participant to the teacher, whichever seemed the most appropriate. Each behavioral event was recorded as it occurred and coded by hand on a data sheet attached to a clipboard held by the observer. In addition to the written data collection, observational sessions for each participant were recorded with a micro-tape recorder held by the observer.

Inter-Observer Agreement

Prior to the actual data collection, a one-month observation period was utilized as pilot testing in order to refine the observation scale and train observers. Although informal observations done by this investigator during piloting suggested that the teachers and students were accustomed to visitors and observers in the classroom and work area, this period allowed for habituation of participants to the presence of observers. It was reported by the observers that they were generally ignored by the participants.

Inter-observer agreement of at least 85% was established during the preliminary period. Such agreement was calculated as the number of agreements between observers divided by agreements plus disagreements multiplied by 100 (Krupski, 1979). Furthermore, interobserver agreement between the investigator and an observer was assessed for each observer at least once during each composite day throughout the study. Therefore, four agreement checks were conducted for each of the 15 participants (range = 77 to 100%, mean of agreement 90%) for a total of 60 agreement checks. Inter-observer agreement information may be found in Table 1.

Table 4

Degree of Inter-Observer Agreement in Judgments of Utterance Type, Setting, Function, and Response of Listener

	Mean %	*Range*
Utterance Type	97%	86-100%
Setting	98%	85-100%
Function	90%	77-100%
Response of Listener	92%	85-100%

Note. Inter-Observer Agreement was calculated as the number of agreements between observers divided by agreements plus disagreements multiplied by 100 (Krupski, 1979).

CHAPTER III

RESULTS

The results are reported in four sections: (1) prevalence data of verbal perseverations compared to not verbal perseverations; (2) examination of communicative intent and communicative functions of verbal perseverations compared to not verbal perseverations; (3) examination of settings in which verbal perseverations compared to not verbal perseverations occurred; and (4) responses of listener to verbal perseverations compared to not verbal perseverations.

Prevalence Data

There are no available data documenting how often verbal perseverations occur in those persons with autism who manifest such behavior. As such, the first question addressed in this study was: What percentage of the total number of utterances consist of verbal perseverations?

All verbal utterances were coded as one of the following utterance types: Unintelligible, verbal perseveration (VP), or not verbal perseveration (NVP). A breakdown of these results for each participant is contained in Table 5. Data are reported as frequencies and percentages of total utterances.

Table 5

Frequencies and Percentages of Utterance Type

Subject	Unintelligible		Verbal Perseveration		Not Verbal Perseveration		Total
1	75	(2%)	322	(11%)	2656	(87%)	3053
2	38	(5%)	89	(10%)	724	(85%)	851
3	34	(5%)	24	(3%)	684	(92%)	742
4	95	(9%)	352	(32%)	651	(59%)	1098
5	60	(2%)	978	(24%)	2992	(74%)	4030
6	181	(12%)	122	(8%)	1245	(80%)	1548
7	212	(12%)	329	(18%)	1262	(70%)	1803
8	168	(8%)	244	(12%)	1671	(80%)	2083
9	38	(2%)	478	(21%)	1734	(77%)	2250
10	75	(3%)	462	(19%)	1925	(78%)	2462
11	205	(6%)	470	(13%)	2848	(81%)	3523
12	215	(7%)	1012	(35%)	1684	(58%)	2911
13	36	(2%)	288	(14%)	1700	(84%)	2024
14	149	(8%)	183	(10%)	1539	(82%)	1871
15	92	(3%)	653	(22%)	2200	(75%)	2945
Total	1,673		6,006		25,515		33,194
Mean Percentage		5.7%		16.8%		77.4%	100%
SD	4		9		9		

A combined total of 33,194 verbal utterances was coded. Examination of the contents of Table 5 indicates that 1,673 utterances were unintelligible (mean percentage 5.7% of the total number of utterances, range = 2-12%); 6,006 utterances were VPs (mean percentage 16.8%, range = 3-35%); and 25,515 utterances were NVPs (mean percentage 77.4%, range = 58-92%).

Thus, approximately 17% of the total number of utterances observed were verbal perseverations. When looking at individual participants, however, verbal perseverations use ranged from 3% to 35%.

Communicative Intent and Function

Examples of VPs Used With and Without Communicative Intent

Before presenting the results of the analyses pertaining to communicative intent and communicative functions, examples of VPs used with and without communicative intent are presented in order to demonstrate the qualitative nature of such utterances.

Interest Pattern: Favorite foods

Participant and aide are walking together back to the classroom after recess. Participant is directing his utterances to the aide (with communicative intent):

Aide: "[participant's name], hurry up."

Participant: "What's your favorite applesauce?"

Aide: "The other kids are in already, hurry."

Participant: "My favorite margarine Mazola."

Aide: (no response)

Participant: "Is your favorite applesauce Tree Top?" (grabbing aide's hand)

Aide: "You know better." (gently removing participant's hand)

Participant: "What's your favorite milk?"

Aide: "Alright, if I tell you will you stop?"

Participant: "Yes, yes, yes."

Aide: "My favorite milk is (unfinished)

Participant: "Lucerne is your favorite milk, eee-eee!"

Aide: (no response)

Participant: (giggles, grabbing aide's hand, apparently pleased)

Aide: "What am I going to do with you?" (in mock desperation)

Participant is sitting alone at the table. Utterances are not directed toward another person (without communicative intent):

Participant (looking at hand)

Participant: "What's your favorite butter? Ooo-ooo-oh."

Participant: "I like, no it's not my favorite butter anymore." (squeeling loudly, putting head down on table top)

Interest Pattern: Pythons

Participant is sitting at desk looking at a magazine. Teacher is up in front of the room, working at her desk. Participant initiates the interaction (with communicative intent):

Participant: "Hey, you're cool, man, [aide's name]. Watch out, the python will get you." (shaking his fist, good-naturedly)

Aide: "What [participant's name]? I can't hear you."

Participant: "It'll strangle you. It's a strong snake. Big, like that." (makes arm muscle)

Aide: "What [participant's name]?" Oh, snakes. Yeah."

Participant: "Yeah, like I'm so embarrassed, snakes, stupid." (smiling)

Aide: (no response)

Participant: Unintelligible

Aide: (no response)

Participant: "What are you going to do about it, you know, man?"

Aide: (no response)

Participant: "Don't let that python smash your head."

Aide: (no response)

(Continued from previous conversation)

Participant is not directing utterances to another person. He is looking at nothing in particular (without communicative intent):

Participant: Unintelligible (smiles to himself, puts hands over face)

Participant: "Oh no, don't get me, choke." (laughing)

Participant: "Eat it, yeah, python for dinner. Oh no, McDonald's." (eyes darting around room, laughing)

The interest patterns observed in this study ranged from the highly unusual (water heaters, pythons) to those topics that one would expect young people to talk about (rock 'n' roll music, cars). What made these interest patterns so salient and noteworthy was the excessive nature of the related VPs. Furthermore, the fact that such utterances were brought up regardless of the conversation or environmental happenings at hand made them appear peculiar.

Interestingly, observers noted that how strange they perceived the interest pattern to be was often dependent on how the related VPS were used by the speaker. Not surprisingly, VPS not directed toward another person (looking at hand: "What's your favorite butter? Ooo-ooo-oh.") seemed more bizarre than VPs directed toward another person (Aide: "You know better." Participant: "What's your favorite milk?" Aide: "Alright, if I tell you will you stop?"). Whereas the former appeared to serve a stimulatory purpose, the latter seemed to be used as an effective tool in maintaining contact with another person. The results of the analyses performed to explore the purposes for which VPs compared to NVPs were used in the sample will be described in the following sections.

Communicative Intent of VPs Compared to NVPs

Two questions were addressed in this section: (1) When VPs occur, what is the extent to which they are used with communicative intent? and (2) How does this compare to NVPs? All verbal utterances were coded with one of the following functions: non-person, interactive, informative, regulative, and other. The functions considered to be indicative of communicative intent were interactive, informative, and regulative. The function considered to be indicative of non-communicative intent was non-person. Utterances which could not clearly be classified fell into the remaining category of other.

Results are reported in Table 6. By far, the majority of both VPs (83%) and NVPs (91%) were classified in categories indicative of communicative intent, either for social interaction, to give or get information, or to regulate someone's behavior. On the other hand, a far smaller percentage of both VPs (16%)

and NVPs (9%) was judged as being non-communicative, that is, they were non-person oriented. Few utterances of either type fell into the category of other.

To examine whether VPs were used significantly more or less with communicative intent than NVPs, a two-factor analysis of variance for repeated measures utilizing a Randomized Block Factorial (Kirk, 1982) was performed. Mean percentage of utterances was the dependent variable. Utterance type (VP vs. NVP) and intent (communicative intent vs. non-communicative intent) were the independent variables. Mean percentages and standard deviations for each cell of the design are reported in Table 6. Results are reported in Table 7.

Results of the analysis indicate that all utterances were used significantly more with communicative intent than without communicative intent (F = 559.74, p = <.001), and a significant Utterance Type x Intent interaction (F = 6.10, p = <.05) was found. A posteriori nonorthogonal pairwise comparisons, using the Duncan Multiple Range Test (Kirk, 1982) indicate that the mean percentage of VPs used with communicative intent (83%, SD = 14) was significantly greater than the mean percentage of NVPs used without communicative intent (9%, SD = 6). Likewise, the mean percentage of NVPs used with communicative intent (91%, SD = 6) was significantly

Table 6

Mean Percentages and Standard Deviations of VPs and NVPs Classified as Indicative of Communicative Intent Compared to Those Classified as Indicative of Non-Communicative Intent.

	Verbal Perseverations		Not Verbal Perseverations		All Utterances	
Intent	M	SD	M	SD	M	SD
Communicative Intent	83	14	91	6	87	11
Non-Communicative Intent	16	14	9	6	12	11

Note. Percentage of utterance per participant was calculated by dividing the number of each type of utterance (VP or NVP) occurring in each intent category for that participant by the total number of the same type of utterance (VP or NVP) for that participant. Mean percentage of VPs and NVPs occurring in each intent category was calculated by adding all of the percentages of utterances for each intent category and each type of utterance and dividing the total by the number of participants.

Table 7

Analysis of Variance of the Mean Percentages of Utterance Types (VPs vs. NVPs) Classified as Indicative of Communicative Intent Compared to Those Classified as Indicative of Non-Communicative Intent.

Source	df	ANOVA SS	F	p
Utterance Type	1	.0000	.00	.969
Intent	1	8.3662	559.74	.0001**
Utterance Type x Intent	1	.091	6.10	.0177*
Error	42	.628		

*p = <.05

**p = <.001

greater than the mean percentage of VPs used without communicative intent (16%, SD = 14). However, there was no significant difference between the mean percentage of VPs (83%) and NVPs (91%) used with communicative intent and the mean percentage of VPs (16%) and NVPs (9%) used without communicative intent. It should be pointed out that the significant interaction effect was unusual, considering there was no significant difference between VPs and NVPs used with communicative intent, as well as no significant difference between VPs and NVPs used without communicative intent.

In summary, the results of the analysis indicate that most utterances were person-oriented, and thus judged to be used with communicative intent. Furthermore, there was no significant difference to the extent that VPs and NVPs were used communicatively.

Comparison Between High VP Group, Medium VP Group, and Low VP Group in Terms of Communicative Intent

Another analysis was performed to examine whether individual differences in the frequency of VP use were related to the degree that such utterances were used with communicative intent. In order to examine this question participants were rank ordered according to their total percentage of VPs. They were then divided into 3 groups:

high, consisting of those whose percentages fell in the upper third; medium, consisting of those whose percentages fell in the middle third; and low, consisting of those whose percentages fell in the lowest third. There were 5 participants in each group. The high group's mean percentage was 27%; the medium group's mean percentage was 15%; and the low group's mean percentage was 8%.

An analysis of variance for repeated measures utilizing a Split-Plot Factorial Design was performed. Mean percentage of VPs was the dependent variable. Group (high vs. medium vs. low) and intent (communicative vs. non-communicative) were the independent variables. Results are reported in Table 8. Mean percentages and standard deviations are reported in Table 9.

Results of the analysis indicate a significant main effect for intent (F = 82.01, p = <.001), but there was no significant effect for group (F = .37, p = .69) nor was there a significant Group x Intent interaction (F = .49, p = .62). All utterances were used significantly more with communicative intent (mean percentage 83%, SD = 14) than without communicative intent (mean percentage 16%, SD = 14). The results of these analyses indicate that there was no significant difference between the extent to which participants who used VPs at a relatively high level used such utterances with communicative intent, and the extent to which participants who used

Table 8

Analysis of Variance of the Mean Percentages of VPs as a Function of Group (High vs. Medium vs. Low) and Communicative Intent

Source	*df*	ANOVA SS	*F*	*p*
Group	2	.000	.37	.6968
Error	12	.000		
Intent	1	3.334	82.01	.0001**
Group x Intent	2	.040	.49	.6223
Error	12	.488		

$**p = <.001$

Table 9

Mean Percentages and Standard Deviations of VPs as a Function of Group (High vs. Medium vs. Low) and Communicative Intent

	High Group		Medium Group		Low Group		All Utterances	
Intent	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Communicative Intent	82	17	79	17	88	8	83	14
Non-Communicative Intent	18	16	20	17	12	7	16	14

Note. Percentage of VPs per participant was calculated by dividing the number of VPs of each group (high or medium or low) occurring in each intent category for that participant by the total number of VPs for that participant. Mean percentage of VPs of each group (high or medium or low) occurring in each intent category was calculated by adding all of the percentages of VPs of each group and each intent category and dividing the total by the number of participants.

VPs at a relatively medium or low level used them with communicative intent.

It should be noted that age did not appear to be a significant factor when comparing the three groups. The mean age was 17.9 years for the high group, 18.3 years for the medium group, and 17.8 years for the low group.

In summary, several analyses were performed to examine the extent to which VPs were used communicatively and how this compared to NVPs. Most utterances (83-91%) were used with communicative intent, with no significant difference in the use of VPs and NVPs with regard to communicative intent. It was also demonstrated that participants who used VPs at a relatively high or low level did not differ significantly in the extent to which they used such utterances with communicative intent compared to those who used VPs at a relatively medium level.

Comparison Between Communicative Functions of VPs and Communicative Functions of NVPs

Two questions were addressed in this section: (1) When VPs are used with communicative intent, with what types of communicative intent are they used; and (2) How does this compare to NVPs? A two-factor analysis of variance for repeated measures was performed to examine the relationship between utterance type and function.

Mean percentage of utterances was the dependent variable. Utterance type (VP vs. NVP) and communicative function (interactive vs. informative vs. regulative) were the independent variables. Results are reported in Table 10. Mean percentages and standard deviations for each cell of the design are reported in Table 11.

Results of the analysis indicate a significant main effect for function (F = 108.77, p .<001) and no significant effect for utterance type (F = 85, p .36). Pairwise comparisons, using the Duncan test indicate that the frequency of interactive utterances (mean percentage 54%, SD = 22) was significantly higher than the frequency of informative utterances (mean percentage 32%, SD = 23), which were, in turn, significantly higher than regulative utterances (mean percentage 2%, SD = 2).

More importantly, a significant Utterance Type x Function interaction was found (F = 41.43, p .<001). The Duncan test was used to examine this interaction. Results of the Duncan test indicated that VPs were used significantly more often for interactive purposes (mean percentage 68%, SD = 17) than NVPs (mean percentage 39%, SD = 15), while NVPs were used significantly more often for informative purposes (mean percentage 49%, SD = 17) than were VPs (mean percentage 14%, SD = 12). There was no significant difference between VPs and NVPs in the regulative category.

Table 10

Analysis of Variance of the Mean Percentages of Utterance Type (VPs vs. NVPs) Across Communicative Functions

Source	df	ANOVA SS	F	p
Utterance Type	1	.016	.85	.360
Function	2	4.018	108.77	.0001**
Utterance Type x Function	2	1.531	41.43	.0001**
Error	70	1.293		

**p = <.001

Table 11

Mean Percentages and Standard Deviations of Utterance Type (VPs vs. NVPs) As a Function of Communicative Functions

	Verbal Perseverations		Not Verbal Perseverations		All Utterances	
Function	*M*	*SD*	*M*	*SD*	*M*	*SD*
Interactive	68	17	39	15	54	22
Informative	14	12	49	17	32	23
Regulative	1	1	3	3	2	2

Note. Percentage of utterance per participant was calculated by dividing the number of each type of utterance (VP or NVP) occurring in each function category for that participant by the total number of the same type of utterance (VP or NVP) for that participant. Mean percentage of VPs and NVPs occurring in each function category was calculated by adding all of the percentages of utterances for each function category and each type of utterance and dividing the total by the number of participants.

A second area of Utterance Type x Function interaction pertained to the functions within utterance type. The Duncan test revealed that VPs were used significantly more often for interactive purposes than for any other purpose. NVPs, on the other hand, were found to be used significantly more often for informative purposes than for any other purpose.

In summary, an analysis of variance and a posteriori comparisons were performed to ascertain whether, and to what extent, VPs and NVPs were used with different functions. VPs occurred significantly more in the interactive category than the remaining categories. This finding supports the notion that VPs tend to be used for social interaction. On the other hand, NVPs occurred significantly more in the informative category than in the remaining categories. These findings indicate that VPs and NVPs are likely to be used for different functions. It can be concluded, therefore, that VPs and NVPs differed significantly according to the types of communicative intent with which they were used.

Initiation Interactive vs. Response Interactive

Since the results of the analysis of variance revealed that VPs tended to be used primarily for interactive purposes compared to the other functions, supplementary analyses examining the interactive category were performed. For these analyses, initiation interactive and response interactive were compared in order to examine whether utterances were used to initiate social interactions, or whether they were used to maintain social interactions which were in progress.

A two-factor analysis of variance for repeated measures was performed to examine the relationship between utterance type and the interactive function. Mean percentage of utterances was the dependent variable. Utterance type (VP vs. NVP) and interactive function (initiation vs. response) were the independent variables. Results are reported in Table 12. Means and standard deviations are reported in Table 13.

Results of the analysis indicate a significant main effect for utterance type ($\underline{F}$ = 17.47, $\underline{p}$ <.001) and function ($\underline{F}$ = 217.07, $\underline{p}$ <.001), and a significant Utterance Type x Function interaction ($\underline{F}$ = 17.47, $\underline{p}$ <.001). All utterances occurred significantly more frequently as responses (mean percentage 43%, $\underline{SD}$ = 19) than as initiations (mean percentage 7%, $\underline{SD}$ = 6). As noted previously, both VPs and NVPs were used more frequently as responses within interactions rather than as initiations. VPs, however, were significantly more likely to occur as responses in these situations (mean percentage 56%, $\underline{SD}$ = 16) than were NVPs (mean percentage 30%, $\underline{SD}$ = 13) These effects were confirmed by Duncan pairwise

Table 12

Analysis of Variance of the Mean Percentages of Utterance Type (VPs vs. NVPs) for Interactive Function, Initiation vs. Response

Source	df	ANOVA SS	F	p
Utterance Type	1	0.315	31.99	.0001**
Function	1	2.137	217.07	.0001**
Utterance Type x Function	1	0.172	17.47	.0001**
Error	42	0.413		

$^{**}p$ = <.001

Table 13

Mean Percentages and Standard Deviations of Utterance Type (VPS vs. NVPs) as a Function of Interactive Function, Initiation vs. Response

Interactive Function	Verbal Perseverations *M*	Verbal Perseverations *SD*	Not Verbal Perseverations *M*	Not Verbal Perseverations *SD*	All Utterances *M*	All Utterances *SD*
Initiation	9	7	5	3	7	6
Response	56	16	30	13	43	19

Note. Percentage of utterance per participant was calculated by dividing the number of each type of utterance (VP or NVP) occurring in each function category for that participant by the total number of the same type of utterance (VP or NVP) for that participant. Mean percentage of VPs and NVPs occurring in each function category was calculated by adding all of the percentages of utterances for each function category and each type of utterance and dividing the total by the number of participants.

comparisons.

In summary, a second set of analyses was performed to examine the occurrence of VPs and NVPs in the interactive category by comparing initiation interactive with response interactive. First, it was found that all utterances, VPs and NVPs, were used significantly more as responses than initiations. This finding is consistent with the observation that persons with autism make fewer initiations than responses (Hurtig, et al., 1982). Furthermore, it was found that although both VPs and NVPs were more likely to occur as responses than initiations, a VP was significantly more likely than a NVP to occur in this situation. In other words, when used for interactive purposes, both VPs and NVPs tended to be used to maintain a social interaction rather than to initiate an interaction. However, VPs were more likely to do so than NVPs.

Initiation Informative vs Response Informative

Since the results of the analysis of variance revealed that NVPs tended to be used primarily for informative purposes compared to the other functions, supplementary analyses examining the informative category were performed. For these analyses, initiation informative and response informative were compared. A two-factor analysis of variance for repeated measures was performed to examine the relationship between utterance type and the informative function. Mean percentage of utterances was the dependent variable. Utterance type (VP vs. NVP) and informative function (initiation vs. response) were the independent variables. Results are reported in Table 14. Mean percentages and standard deviations are reported in Table 15.

Results of the analysis indicate a significant main effect for utterance type (F = 70.08, p <.001) and function (F = 133.77, p <.001), and a significant Utterance Type x Function interaction (F = 54.72, p <.001). All utterances occurred significantly more frequently as responses (mean percentage 28%, SD = 21) than as initiations (mean percentage 4%, SD = 4). When used for informative purposes, both VPs and NVPs were used more frequently as responses rather than as initiations. NVPs, however, were more likely to occur as responses in these situations (mean percentage 44%, SD = 16) than were VPs (mean percentage 11%, SD = 9). These findings were confirmed by Duncan pair-wise comparisons.

In summary, three sets of analyses were performed dealing with the interaction between utterance type and function. The questions guiding these analyses were: (1) With what types of functions are VPs used; and (2) How does this compare to NVPs?

Results indicate that utterances tended to be

Table 14

Analysis of Variance of the Mean Percentages of Utterance Type (VPs vs. NVPs) for Informative Function, Initiation vs. Response

Source	df	ANOVA SS	F	p
Utterance Type	1	0.457	70.08	.0001**
Function	1	2.872	133.77	.0001**
Utterance Type x Function	1	0.357	54.72	.0001**
Error	42	0.274		

**p = <.001

Table 15

Mean Percentages and Standard Deviations of Utterances as a Function of Informative Function, Initiation vs. Response

Informative Function	Verbal Perseverations M	Verbal Perseverations SD	Not Verbal Perseverations M	Not Verbal Perseverations SD	All Utterances M	All Utterances SD
Initiation	3	4	5	4	4	4
Response	11	9	44	16	28	21

Note. Percentage of utterance per participant was calculated by dividing the number of each type of utterance (VP or NVP) occurring in each function category for that participant by the total number of the same type of utterance (VP or NVP) for that participant. Mean percentage of VPs and NVPs occurring in each function category was calculated by adding all of the percentages of utterances for each function category and each type of utterance and dividing the total by the number of participants.

used as responses to other utterances, rather than as initiations. VPs were more likely than NVPs to be used for social interaction, while NVPs tended to be used for information. When a response in a social interaction was required, a VP was more likely to be used than a NVP. Finally, when a response for informative purposes was required, a NVP was more likely to be used than a VP.

Summary of Communicative Intent and Function Analyses

The findings of the analyses pertaining to communicative intent and function support the prediction that a proportion of VPs would be used communicatively. In fact, it was found that the majority of both VPs and NVPs were used with communicative intent, with no significant difference in the extent to which each type of utterance was used as such. Furthermore, it was found that level of VP use (high vs. medium vs. low) did not affect the extent to which VPs were used communicatively. Finally, it was demonstrated that VPs and NVPs are used with different types of communicative intent. VPs tend to be used for social interaction, while NVPs are more apt to be used for information.

Setting and Response of Listener

The preceding analyses allowed for examining the communicative intent and communicative functions of VPs compared to NVPs. Since little is known about VPs, data were also collected on the circumstances surrounding the occurrence of VPs in order to begin to develop a knowledge base concerning this behavior. These data are reported in 2 sections. In the first section, data related to the settings in which VPs and NVPs occurred will be reviewed. In the second section, data pertaining to the response of listener to VPs and NVPs will be presented.

Setting

Settings in Which VPs Occurred Compared to Settings in Which NVPs Occurred

All utterances were coded as occurring in one of the following settings: work, free-time, transition, snack/lunch, and other. Two questions were addressed: (1) In what settings do VPs occur; and (2) Do the settings in which VPs occur differ from those in which NVPs occur? It was noted that the proportion of time spent in each setting differed for each participant. For example, participant #8 spent approximately 41% of his day engaged in work, while participant #5 spent approximately 29% of her day engaged in work. (See Table 16). Therefore, observations were weighted to reflect the proportion of an average day spent in each setting for each participant. A weighted two-factor analysis of variance for repeated measures was performed to examine the relation-

Table 16

Percentages of an Average Day Spent in Each Setting for Each Participant

Subject	Work	Free-Time	Transition	Snack/Lunch	Other
1	33%	25%	21%	21%	0%
2	37%	25%	21%	17%	0%
3	25%	41%	17%	17%	0%
4	13%	41%	25%	21%	0%
5	29%	25%	21%	21%	4%
6	25%	41%	17%	17%	0%
7	46%	22%	18%	14%	0%
8	41%	17%	25%	17%	0%
9	46%	22%	18%	14%	0%
10	46%	22%	18%	14%	0%
11	50%	17%	16%	17%	0%
12	50%	17%	16%	17%	0%
13	41%	17%	21%	17%	4%
14	41%	25%	17%	17%	0%
15	37%	25%	21%	17%	0%
Mean Percentage	37%	25%	19%	17%	1/2%

ship between utterance type and setting. Mean percentage of utterances was the dependent variable. Utterance type (VP vs. NVP) and setting (work vs. free-time vs. transition vs. snack/lunch) were the independent variables. (The category of other was dropped because 0% could not be used in a weighted analysis of variance. It should be noted that 13 of the 15 participants spent 0% time in this category.) Results are reported in Table 17. Mean percentages and standard deviations are reported in Table 18.

Results of the analysis indicate a significant main effect for setting ($\underline{F}$ = 44.93, $\underline{p}$ <.001), but no significant effect for utterance type ($\underline{F}$ = .40, $\underline{p}$ = 1.0). Pair-wise comparisons using the Duncan test revealed that all utterances occurred significantly more often in work (mean percentage 48%, $\underline{SD}$ = 18) than in transition (mean percentage 26%, $\underline{SD}$ = 17), significantly more often in transition than in free-time (mean percentage 18%, $\underline{SD}$ = 9), and significantly more often in free-time than snack/lunch (mean percentage 7%, $\underline{SD}$ = 9).

More importantly, a significant Utterance Type x Setting interaction was found ($\underline{F}$ = 4.11, $\underline{p}$ <.05). Results of the Duncan test indicated that NVPs occurred significantly more often in work (mean percentage 56%, $\underline{SD}$ = 13) than did VPs (mean percentage 41%, $\underline{SD}$ = 20). No significant differences were found between VPs and NVPs

Table 17

Weighted Analysis of Variance of the Mean Percentages of Utterance Type (VPs vs. NVPs) Across Settings

Source	df	ANOVA SS	F	p
Utterance Type	1		.40	1.0000
Setting	4	2.836	44.93	0.0001**
Utterance Type x Setting	4	0.2595	4.11	0.0087*
Error	98			

*p = <.05

**p = <.001

Table 18

Mean Percentages and Standard Deviations of Utterance Type as a Function of Setting

	Verbal Perseverations		Not Verbal Perseverations		All Utterances	
Function	*M*	*SD*	*M*	*SD*	*M*	*SD*
Work	41	20	56	13	48	18
Free-Time	19	12	16	6	18	9
Transition	31	20	22	13	26	17
Snack/Lunch	8	12	5	5	7	9

Note. Percentage of utterance per participant was calculated by dividing the number of each type of utterance (VP or NVP) occurring in each setting category for that participant by the total number of the same type of utterance (VP or NVP) for that participant. Mean percentage of VPs and NVPs occurring in each setting category was calculated by adding all of the percentages of utterances for each setting category and each type of utterance and dividing the total by the number of participants.

in the remaining categories.

A second area of Utterance Type x Setting interaction pertained to the settings within each utterance type. The Duncan test revealed that VPs occurred significantly more often in work (mean percentage 41%, SD = 20) and transition (mean percentage 31%, SD = 20) than free-time (mean percentage 19%, SD = 12), and significantly more often in free-time than snack/lunch (mean percentage 8%, SD = 12).

Likewise, NVPs occurred significantly more often in work (mean percentage 56%, SD = 13) than in any other setting, and more often in transition (mean percentage 22%, SD = 13) than snack/lunch (mean percentage 5%, SD = 5). However, there was no significant difference between transition and free-time (mean percentage 16%, SD = 6).

In summary, utterances were coded according to the setting in which they occurred. VPs and NVPs manifested a similar pattern of occurrence. Both occurred most often in work, followed in order by transition, free-time, and snack/lunch. However, a significantly higher mean percentage of NVPs (56%) than VPs (41%) occurred during work, indicating that NVPs were more likely to occur in this setting than were VPs.

Interaction Between Setting and Communicative Intent of VPs

To determine if VPs occurred in different settings depending on whether or not they were used with communicative intent, a two-factor analysis of variance for repeated measures was performed. Mean percentages of utterances was the dependent variable. Setting (work vs. free-time vs. transition vs. snack/lunch vs. other) and intent (communicative intent vs. non-communicative intent) were the independent variables. Results are reported in Table 19. Mean percentages and standard deviations are reported in Table 20.

Results of the analysis indicate a significant main effect for setting ($F = 15.04$, $p = <.001$) and intent ($F = 51.60$, $p <.001$), and a significant Setting x Intent interaction ($F = 5.26$, $p = <.05$). All utterances occurred more often in work (mean percentage 21%, *SD* = 18) or transition (mean percentage 15%, *SD* = 18) than in free-time (mean percentage 9%, *SD* = 10), snack/lunch (mean percentage 4%, *SD* = 9), and other (mean percentage 1%, *SD* = 4). Significantly more VPs used with communicative intent occurred in work (mean percentage 32%, *SD* = 18), free-time (mean percentage 16%, *SD* = 11), and transition (mean percentage 27%, *SD* = 20), compared with VPs used without communicative intent (mean percentage 10%, *SD* = 10; mean percentage 3%, *SD* = 5; and mean percentage 3%,

Table 19

Analysis of Variance of the Mean Percentages of VPs as a Function of Setting and Communicative Intent

Source	df	ANOVA SS	F	p
Setting	4	.778	15.04	.0001**
Intent	1	.667	51.60	.0001**
Setting x Intent	4	.272	5.26	.0006**
Error	126	1.628		

**p = <.001

Table 20

Mean Percentages and Standard Deviations of VPs as a Function of Communicative Intent Across Settings

	Communicative Intent		Non-Communicative Intent		All Utterances	
Function	*M*	*SD*	*M*	*SD*	*M*	*SD*
Work	32	18	10	10	21	18
Free-Time	16	11	3	5	9	10
Transition	27	20	3	3	15	18
Snack/Lunch	7	12	<1	<1	4	9
Other	2	6	<1	1	1	4

Note. Percentage of utterance per participant was calculated by dividing the number of VPs of each type of intent (communictive intent vs. non-communicative intent) occurring in each setting category for that participant by the total number of VPs of the same type of intent (communicative intent vs. non-communicative intent) for that participant. Mean percentage of VPs occurring in each setting category was calculated by adding all of the percentages of utterances for each setting category and each type of communicative intent and dividing the total by the number of participants.

SD = 3, respectively). On the other hand, there was no significant difference between VPs used with or without communicative intent in snack/lunch and other. These effects were confirmed by Duncan pair-wise comparisons.

A second area of Communication x Setting interaction pertained to the settings within communication categories. The Duncan test revealed that significantly more VPs used with communicative intent occurred in work, free-time, and transition than snack/lunch and other, while there was no significant difference among the settings for VPs used without communicative intent.

Setting Data for Individual Participants

Data on settings for VPs for each participant are found in Table 21 and are reported as frequencies and percentages of total number of VPs. Data on settings for NVPs for each participant are found in Table 22 and are reported as frequencies and percentages of total number of NVPs. It should be noted that the prevalent pattern of occurrence held true for NVPs more than VPs. Whereas NVPs for all participants occurred most often in work, VPs occurred most often in work for 10 of the 15 participants. These data indicate that there is more variation in the settings in which VPs occur compared to NVPs.

In addition to the above reviewed data on settings,

Table 21

Frequencies and Percentages of VPs as a Function of Setting

Subject	Work		Free-Time		Transition		Snack/Lunch		Other		Total
1	175	(54%)	7	(2%)	135	(42%)	5	(2%)	0		322
2	49	(55%)	22	(25%)	14	(16%)	4	(4%)	0		89
3	7	(29%)	10	(42%)	6	(25%)	1	(<1%)	0		24
4	146	(42%)	83	(24%)	115	(33%)	4	(1%)	0		348
5	458	(47%)	102	(11%)	131	(13%)	14	(1%)	273	(28%)	978
6	4	(3%)	14	(12%)	95	(78%)	9	(7%)	0		122
7	166	(51%)	4	(1%)	156	(47%)	3	(1%)	0		329
8	75	(31%)	22	(9%)	24	(10%)	123	(50%)	0		244
9	72	(15%)	157	(33%)	228	(47%)	21	(4%)	0		478
10	277	(60%)	58	(13%)	97	(21%)	30	(6%)	0		462
11	102	(22%)	65	(14%)	258	(55%)	45	(9%)	0		470
12	233	(26%)	304	(34%)	220	(24%)	140	(16%)	0		897
13	160	(56%)	81	(28%)	41	(14%)	0		6	(2%)	288
14	71	(39%)	39	(21%)	59	(33%)	12	(7%)	0		181
15	517	(79%)	96	(15%)	23	(3%)	17	(3%)	0		653
Total	2512		1064		1602		428		279		5885
Mean Percentage		40.6%		18.93%		30.73%		7.4%		2%	100%
SD	20		12		20		20		7		

Table 22

Frequencies and Percentages of NVPs as a Function of Setting

Subject	Work	Free-Time	Transition	Snack/Lunch	Other	Total
1	1234 (47%)	218 (8%)	955 (36%)	249 (9%)	0	2565
2	598 (82%)	85 (12%)	27 (4%)	14 (2%)	0	724
3	423 (62%)	60 (9%)	184 (27%)	17 (2%)	0	684
4	276 (51%)	94 (17%)	164 (30%)	11 (2%)	0	545
5	1701 (57%)	627 (21%)	321 (11%)	296 (10%)	44 (1%)	2989
6	502 (40%)	213 (17%)	473 (38%)	57 (5%)	0	1245
7	602 (48%)	98 (8%)	530 (42%)	32 (2%)	0	1262
8	1130 (68%)	140 (8%)	52 (3%)	349 (21%)	0	1671
9	753 (44%)	481 (28%)	458 (26%)	41 (2%)	0	1733
10	809 (42%)	372 (19%)	607 (32%)	134 (7%)	0	1922
11	1441 (51%)	527 (18%)	646 (23%)	234 (8%)	0	2848
12	941 (56%)	406 (24%)	263 (16%)	65 (4%)	0	1675
13	930 (55%)	407 (24%)	334 (20%)	8 (<1%)	21 (1%)	1700
14	1078 (70%)	248 (16%)	179 (12%)	34 (2%)	0	1539
15	1643 (75%)	326 (15%)	146 (6%)	83 (4%)	0	2198
Total	14061	4302	5339	1624	65	25391
Mean Percentage	56.53%	16.27%	21.73%	5.33%	.13%	100%
SD	13	6	13	5	<1	

information was gathered concerning events (Atypical Antecedents) which immediately preceded utterances and which observers judged to have a possible effect on the participants. Such information was utilized when describing behavior patterns of individual participants (see Appendix B).

Summary of Setting Analyses

Data were collected on the settings in which VPs occurred compared with the settings in which NVPs occurred. Utterances of both types occurred most often in work, followed in order by transition, free-time, snack/lunch and other. However, this pattern did not hold true for all participants and was more the case for NVPs than VPs. Furthermore, although NVPs were more likely to occur in all settings than were VPs, this was significantly more likely to occur in work than in other settings. Another finding was that when used with communicative intent, VPs tended to occur more often in work, transition, and free-time than snack/lunch and other as compared with VPs used without communicative intent. Finally, significantly more VPs used with communicative intent occurred in work, transition, and free-time than snack/lunch and other, while there was no significant difference among the settings for VPs used without communicative intent.

Response of Listener

Response of Listener to VPs Compared to NVPs

All utterances were coded with one of the following responses of listener: positive, negative, neutral and no response. The question addressed was: Does the listener respond to VPs differently than to NVPs?

A two-factor analysis of variance for repeated measures was performed to examine the relationship between utterance type and response of listener. Mean percentage of utterances was the dependent variable. Utterance type (VP vs. NVP) and response of listener (positive vs. negative vs. neutral vs. no response) were the independent variables. Results are reported in Table 23. Mean percentages and standard deviations may be found in Table 24.

Results of the analysis indicate a significant main effect for response of listener (F = 7.506, p <.001), but no significant main effect for utterance type (F = .00, p 1.0). Pair-wise comparisons using the Duncan test revealed that all utterances received significantly more neutral responses (mean percentage 63%, SD = 16) than no responses (mean percentage 31%, SD = 16), which, in turn, occurred significantly more often than either positive (mean percentage 3%, SD = 3) or negative (mean percentage 3%, SD = 4) responses.

Table 23

Analysis of Variance of the Mean Percentages of Utterance Type (VPs vs. NVPs) As a Function of Response of Listener

Source	df	ANOVA SS	F	p
Utterance Type	1	0.0000	0.00	1.0000
Response	3	7.5060	179.12	.0001**
Utterance Type x Response	3	0.1859	4.44	.0059*
Error	98	9.0607		

*p = <.05

**p = <.001

Table 24

Mean Percentages and Standard Deviations of Utterance Type as a Function of Response of Listener

Response of Listener	Verbal Perseverations		Not Verbal Perseverations		All Utterances	
	M	SD	M	SD	M	SD
Positive	2	2	4	4	3	3
Negative	3	4	2	3	3	4
Neutral	58	19	69	11	63	16
No Response	37	18	25	11	31	16

Note. Percentage of utterance per participant was calculated by dividing the number of each type of utterance (VP or NVP) occurring in each response of listener category for that participant by the total number of the same type of utterance (VP or NVP) for that participant. Mean percentage of VPs and NVPs occurring in each response of listener category was calculated by adding all of the percentages of utterances for each response of listener category and each type of utterance and dividing the total by the number of participants.

More importantly, a significant Utterance Type x Response interaction was found (F = 4.44, p <.05). Results of the Duncan test indicated that a neutral response was given to significantly more NVPs (mean percentage 69%, SD = 11) than VPs (mean percentage 58%, SD = 19), while no response was given to significantly more VPs (mean percentage 37%, SD = 18) than NVPs (mean percentage 25%, SD = 11). No significant difference was found between VPs and NVPs in the positive or negative categories.

A second area of Utterance Type x Response interaction pertained to the responses within utterance type. The Duncan test revealed that significantly more VPs were given a neutral response (mean percentage 58%, SD = 19) than a no response (mean percentage 37%, SD = 18), while more VPs were given a no response than either a positive (mean percentage 2%, SD = 2) or a negative (mean percentage 4%, SD = 4) response. There was no significant difference between the positive or negative categories.

Responses to NVPs occurred in a similar pattern. The Duncan test revealed that significantly more NVPs were given a neutral response (mean percentage 69%, SD = 11) than a no response (mean percentage 25%, SD = 11), while more NVPs were given a no response than either a positive (mean percentage 4%, SD = 4) or a negative (mean percentage 2%, SD = 3) response. There was no significant difference between the positive or negative categories.

In summary, utterances were coded according to response of listener. Both VPs and NVPs were responded to similarly. The majority of both types of utterances was given a neutral response, followed in frequency of occurrence by no response. Positive and negative responses occurred much less frequently. Further analyses examining mean percentages demonstrated that a significantly higher mean percentage of VPs than NVPs was responded to with no response, while a significantly higher mean percentage of NVPs than VPs was given a neutral response. VPs and NVPs did not differ significantly in the extent that they were responded to negatively or positively.

These data partially support the prediction that VPs would be given more negative and no responses than NVPs based on the assumption that VPs are an undesirable behavior that the listener would wish to discourage. Results indicate that although VPs and NVPs did not differ in the extent to which they were responded to negatively, VPs received significantly more no responses than did NVPs. These findings suggest that the listener tends to ignore VPs when they occur.

Interaction Between Response of Listener and Communicative Intent

To determine if the response of the listener was affected by whether or not VPs were used with communicative intent, a two-factor analysis of variance for repeated measures was performed. Mean percentages of verbal perseverations was the dependent variable. Response (positive vs. negative vs. neutral vs. no response) and intent (communicative intent vs. non-communicative intent) were the independent variables. Results are reported in Table 25. Mean percentages and standard deviations are reported in Table 26.

Results of the analysis indicate a significant main effect for response of listener (*F* = 49.58, *p* = <.001) and intent (*F* = 72.79, *p* <.001), and a significant Intent x Response interaction (F = 43.69, *p* = <.001). The most common response given to VPs was neutral (mean percentage 29%, *SD* = 32), followed in order by no response (mean percentage 18%, *SD* = 14) negative (mean percentage 2%, *SD* = 3), and positive (mean percentage 1%, *SD* = 1). Significantly more VPs used with communicative intent were given neutral responses (mean percentage 57%, *SD* = 20) compared with VPs used without communicative intent (mean percentage 1%, *SD* = 2). There was no significant difference in the remaining response categories. These effects were confirmed by Duncan pair-wise comparisons.

Table 25

Analysis of Variance of the Mean Percentages of VPs as a Function of Response of Listener and Communicative Intent

Source	df	ANOVA SS	F	p
Response	3	1.714	49.58	.0001**
Intent	1	.839	72.79	.0001**
Response x Intent	3	1.510	43.69	.0001**
Error	98	1.129		

**p = <.001

Table 26

Mean Percentages and Standard Deviations of VPs as a Function of Communicative Intent Across Response of Listener

Response of Listener	Communicative Intent		Non-Communicative Intent		All Utterances	
	M	SD	M	SD	M	SD
Positive	2	2	0	0	<1	1
Negative	3	4	<1	<1	2	3
Neutral	57	20	1	2	29	32
No Response	22	14	15	13	18	14

Note. Percentage of utterance per participant was calculated by dividing the number of VPs of each type of intent (communicative intent vs. non-communicative intent) occurring in each response category for that participant by the total number of VPs of the same type of intent (communicative intent vs. non-communicative intent) for that participant. Mean percentage of VPs occurring in each response category was calculated by adding all of the percentages of utterances for each response category and each type of intent and dividing the total by the number of participants.

A second area of Response x Intent interaction pertained to the responses within intent categories. The Duncan test revealed that significantly more VPs used with communicative intent received neutral or no responses compared to positive or negative responses, while significantly more VPs used without communicative intent received no responses compared to the other responses.

In summary, the results of the analysis indicate that the listener responds differentially depending on whether or not VPS are used with communicative intent. It was found that the listener tended to give such utterances a neutral response when they were used communicatively.

Comparison Between High VP Group, Medium VP Group, and Low VP Group in Terms of Response of Listener

Another analysis was performed to examine whether response of listener differed according to how often participants used VPs. In order to examine this question participants were rank ordered according to their total percentage of VPs. They were then divided into 3 groups: high, consisting of those whose percentages fell in the upper third; medium, consisting of those whose percentages fell in the middle third; and low, consisting of those whose percentages fell in the lowest third.

There were 5 participants in each group. The high group's mean percentage was 27%; the medium group's mean percentage was 15%; and the low group's mean percentage was 8%.

An analysis of variance for repeated measures utilizing a Split-Plot Factorial Design was performed. Mean percentage of VPs was the dependent variable. Group (high vs. medium vs. low) and response of listener (positive vs. negative vs. neutral vs. no response) were the independent variables. Results are reported in Table 27. Mean percentages and standard deviations are reported in Table 28.

Results of the analysis indicate a significant main effect for response (*F* = 35.61, *p* = <.001) but no significant main effect for group (*F* = .62, *p* = .55), and no significant group x response interaction (*F* = .45, *p* = .839). Neutral responses were the most common responses for all VPs, followed in order by no responses, negative responses, and positive responses. The results of this analysis indicate that there was no significant difference between the responses given to those participants who used VPs at a relatively high level compared to those who used VPs at a relatively medium level compared to those who used VPS at a relatively low level.

Table 27

Analysis of Variance of the Mean Percentages of VPs for Response of Listener to High VP Group Compared to Medium VP Group Compared to Low VP Group

Source	*df*	ANOVA SS	*F*	*p*
Group	2	.010	.62	.555
ID (GP)	12	.095		
Response	3	1.916	35.61	.0001**
Group x Response	6	.049	.45	.839
Error	36	.646		

***p* = <.001

Table 28

Mean Percentages and Standard Deviations of VPs as a Function of Response of Listener and Group (High vs. Medium vs. Low)

Response of Listener	High Group		Medium Group		Low Group		All Utterances	
	M	SD	M	SD	M	SD	M	SD
Positive	1	1	<1	<1	3	2	1	2
Negative	2	1	2	4	4	5	3	4
Neutral	42	20	48	17	46	22	45	19
No Response	23	19	11	8	23	14	20	15

Note. Percentage of VPs per participant was calculated by dividing the number of VPs of each group (high or vs. medium vs. low) occurring in each response category for that participant by the total number of VPs for that participant. Mean percentage of VPs of each group (high vs. medium vs. low) occurring in each response category was calculated by adding all of the percentages of VPs of each group and each response category and dividing the total by the number of participants.

Response of Listener Data for Individual Participants

Data on response of listener for VPs for each participant are found in Table 29 and are reported as frequencies and percentages of total number of VPs. Data on response of listener for NVPs for each paticipant are found in Table 30 and are reported as frequencies and percentages of total number of NVPs.

Summary of Response of Listener Analyses

Data were collected on the response of listener to VPs compared with NVPs. Both types of utterances tended to be given a neutral response, followed by no response. Surpringsly, positive or negative responses were given to either type of utterance. However, when mean percentages were compared it was found that VPs were more likely to be given a no response, while NVPs were more likely to be given a neutral response. Furthermore, significantly more VPs used with communicative intent were given neutral responses compared with VPs used without communicative intent. Finally, frequency of VP use did not significantly affect the responses received.

ble 29

equencies and Percentages of VPs as a Fuıction of Response of Listener

ubject	Positive		Negative		Neutral		No Response		Total
1	22	(7%)	1	(1%)	181	(56%)	118	(37%)	322
2	1	(1%)	8	(9%)	54	(61%)	26	(29%)	89
3	1	(4%)	3	(13%)	6	(25%)	14	(58%)	24
4	4	(1%)	15	(4%)	233	(67%)	99	(28%)	351
5	26	(3%)	36	(1%)	397	(40%)	519	(53%)	978
6	3	(2%)	1	(1%)	74	(61%)	44	(36%)	122
7	0	(0%)	0	(0%)	153	(47%)	176	(53%)	329
8	5	(2%)	24	(10%)	15[illegible]	(63%)	62	(25%)	244
9	2	(1%)	1	(1%)	411	(86%)	64	((4%)	478
10	4	(1%)	6	(1%)	204	(44%)	248	(54%)	462
11	1	(1%)	3	(1%)	375	(80%)	91	(19%)	470
12	2	(1%)	30	(3%)	446	(44%)	534	(53%)	1012
13	0	(0%)	4	(2%)	239	(83%)	44	(15%)	287
14	1	(1%)	0	(0%)	158	(86%)	24	(13%)	183
15	1	(1%)	7	(1%)	219	(34%)	426	(65%)	653
otal	73		1064		3303		2489		6004
ean ercentage		1.47%		3.27%		62.13%		36.80%	100%
D	2		4		19		18		

Table 30

Frequencies and Percentages of NVPs as a Function of Response of Listener

Subject	Positive		Negative		Neutral		No Response		Total
1	236	(9%)	13	(<1%)	1666	(63%)	740	(28%)	2655
2	45	(6%)	56	(8%)	514	(72%)	100	(14%)	715
3	93	(13%)	25	(4%)	381	(56%)	185	(27%)	684
4	33	(5%)	5	(1%)	485	(74%)	128	(20%)	651
5	93	(3%)	131	(4%)	1667	(56%)	1101	(37%)	2992
6	69	(5%)	8	(1%)	791	(63%)	387	(31%)	1245
7	3	(<1%)	1	(<1%)	922	(73%)	331	(26%)	1257
8	141	(8%)	171	(10%)	1110	(67%)	247	(15%)	1669
9	19	(1%)	19	(1%)	1404	(81%)	292	(17%)	1734
10	10	(1%)	58	(3%)	1134	(59%)	721	(37%)	1923
11	30	(1%)	12	(<1%)	1584	(56%)	1221	(43%)	2847
12	23	(1%)	28	(2%)	968	(58%)	664	(39%)	1683
13	22	(1%)	8	(<1%)	1454	(86%)	216	(13%)	1700
14	53	(1%)	5	(<1%)	1307	(85%)	174	(11%)	1539
15	19	(3%)	15	(1%)	1761	(80%)	404	(19%)	2199
Total	879		555		17148		6911		25493
Mean Percentage		3.86%		2.33%		68.6%		25.07%	
SD	4		3		11		11		100%

Summary of Results

Two sets of analyses were presented. The first consisted of prevalence data and an examination of the communicative intent and communicative functions with which VPs were used compared to NVPs. The second consisted of data on the settings in which VPs occurred compared to NVPs, and the responses of the listener to VPs compared to NVPs.

First, it was documented that approximately 17% of the total number of utterances observed consisted of VPs with a range of 3 to 35% for individual participants. Findings from the first set of analyses support the prediction that a proportion of VPs would be used communicatively. In fact, it was found that the majority of both VPs and NVPs were directed toward another person, and thus were judged to be used with communicative intent, with no significant difference in the extent to which they were used as such. Furthermore, it was found that the level of VPs (high vs. medium vs. low) did not affect the extent to which VPs were used communicatively. It was also demonstrated that VPs and NVPs were used with different types of communicative intent. Whereas VPs were more apt to be used for social interaction, NVPs were more likely to be used for information. Finally, findings from these analyses also indicate that whereas both VPs and NVPs were more likely to be used as responses as opposed to initiations, within a social interaction a VP was more likely to occur than was a NVP. Meanwhile, within an exchange of information a NVP was more likely to occur than was a VP.

In the second set of analyses, data were presented which document the parameters surrounding the occurrence of VPs. Both VPs and NVPs occurred most often in work, followed in order by transition, free-time, and snack/lunch. However, when comparing mean percentages it was found that NVPs were more apt to occur in work than were VPs, compared to the other settings. Furthermore, it was demonstrated that when used with communicative intent VPs tended to occur in work, free-time and transition rather than snack/lunch or other more than VPs used without communicative intent.

Finally, the most common responses given to both VPs and NVPs were neutral and no responses. However, when comparing mean percentages it was found that VPs tended to be given no response, while NVPs were more likely to be given a neutral response. In addition, significantly more VPs used with communicative intent were given neutral responses compared to VPs used without communicative intent. A final finding was that frequency of VP use did not significantly affect how such utterances were responded to by the listener.

CHAPTER IV

DISCUSSION AND EDUCATIONAL IMPLICATIONS

The discussion of the findings of this study are organized in four sections: (1) frequency of occurrence, (2) communicative intent and function, (3) setting, and (4) response of listener. The findings will be discussed, along with educational implications, limitations, and suggestions for future research.

Frequency of Occurrence

Approximately seventeen percent of all utterances observed in this study were classified as VPs. A closer look at the data indicates that the range of occurrence was 3-35%. Because of such wide variation, it would seem that VPs play a more significant role for some persons with autism than for others. A behavior that occurs 3% of the time that a person speaks probably has markedly different ramifications than a behavior that occurs approximately one third of the time in which a person speaks. Interestingly, data from this study indicate that frequency of VP use was not significantly related to the response of the listener or whether or not the VP was used with communicative intent. Therefore, although the rate of occurrence is one factor that needs to be considered when assessing this type of behavior in persons with autism, findings from this study suggest that frequency of occurrence may not be as influential a factor as one would expect. One suggestion for future research is to examine whether or not the frequency of VP use affects the degree to which such behavior is perceived as a problem in need of educational intervention.

Communicative Intent and Function

Data were reported which demonstrate that the vast majority of all utterances were directed toward another person. The majority of all utterances fell into the categories judged indicative of communicative intent (interactive, informative, and regulative), while only a small percentage of utterances fell into the category assumed to be indicative of non-communicative intent (non-person). From these data it was concluded that both VPs and NVPs were used primarily with communicative intent. It was also found that there was no significant difference between the extent to which the two types of utterances were used communicatively. This is congruent with the findings that echolalia (Prizant & Duchan, 1981; Prizant & Rydell, 1981) and excessive questioning (Hurtig, et al., 1982), behaviors traditionally considered to be non-communicative in persons with autism, are used for the most part communicatively for a variety of purposes.

One could argue, then, that the current perception of VPs as undesirable and inappropriate may be, for most of the individuals observed in this study, inaccurate. Surely, VP use is a highly unusual, and oftentimes disconcerting, behavior. In fact, because of its salience and uniqueness it is easy to understand why this type of behavior is usually discouraged. It seems, however, that educators, researchers, and parents may need to reevaluate their perceptions of this behavior. Instead of viewing it as a negative behavior to be discouraged, per se, VPs need to be assessed in each individual. In those instances when VPs are used in a purposeful and goal-directed manner, the aim of intervention should be to enhance the underlying function while perhaps modifying the inappropriate way in which it is manifested. On the other hand, in those instances when VPs are used in a non-communicative manner, the aim of intervention should be to eliminate or decrease the behavior or, if possible, to redirect its use for communicative purposes.

An example observed during the study may clarify this latter point: While walking to recess with the aide and a classmate, a participant looked down at a bush and quietly uttered a VP, "That python is going to get me." Such an utterance was judged to be non-communicative since it was not directed toward another person. The aide made no response, and the three walked on in silence. Considering the participant rarely spoke to peers, an alternative approach would have been for the aide to attempt to use the VP to encourage the two peers to talk together. For example, the aide could have said, "You sure like snakes, don't you? Why don't you tell Kathy here what you like about snakes?" Likewise, the aide could have said, "Kathy, you use to have a pet snake. Why don't you tell [participant's name] about it?" If desired, the aide then could have guided the conversation away from the participant's interest pattern (e.g. "Do you have any pets at home?" "We'll be talking about animals in our science lesson tomorrow." "Why don't you tell Kathy what you remember about our science lesson from yesterday?") In other words, instead of dismissing the VP, the aide could have used it as an opener in a social exchange between two peers. The important point to be emphasized is that educators, researchers, and parents should not automatically assume that VPs are undesirable and need to be eliminated because they superficially appear to be inappropriate. Rather these persons should evaluate the role that the behavior plays in the functioning of each individual and design intervention strategies accordingly, including possibly using VPs as a tool to encourage social interactions.

It was also found that when used with communicative intent, the majority of VPs were found to be used for the purpose of social interaction. An interesting finding was the high degree to which such behavior was used in response to other utterances within a social interaction and the low level it was used to initiate a social interaction.

One possible explanation of these findings is related to the fact that the participants made few initiations under any circumstances, the vast majority of all utterances being responses to other utterances. Thus, the fact that the participants rarely used VPs to initiate social interactions may be a reflection of the fact that they initiated few verbal exchanges for any purpose.

A related finding is that even though both VPs and NVPs were used more frequently as responses in social interactions than as initiations, when a VP occurred it was more likely to occur in this situation than was a NVP. A possible explanation of this finding pertains to the difficulty participants may have had in maintaining conversational exchanges. It can be speculated that when initiating an interaction, the participants were able to utilize either VPs or NVPs. However, once the conversation was in progress they had trouble sustaining the exchange and thus, they tended to resort more to VPs than NVPs. It can be postulated that the participants chose a topic they were familiar and comfortable with to keep the interaction in progress, because this strategy was most accessible to them. In addition, VPs are likely a well-learned behavior because of their frequency of occurrence. Thus, such behavior probably occurs more often than behaviors that are not well-learned (Bandura, 1969). Further investigation is needed to examine this issue.

Another possible explanation why the participants resorted more to VPs than NVPs as responses in conversational exchanges is because in certain instances the use of VPs was actually initially encouraged by the listener. Observers noted that on a number of occasions staff members introduced the interest topic of the participant in conversation. (Interest topic: Music - "What year did the Beatles come out with 'She Loves You?'") This was usually followed by a VP on the part of the participant. ("I think 1963.") A brief reciprocal conversational exchange then took place, ending with the staff member terminating the conversation by walking away and ignoring the participant or redirecting the conversation. ("How do you like that book?").

It can be concluded, then, that although many staff members perceived VPs as a negative behavior, others appeared to use the participants' interest patterns as conversational openers to encourage social interactions. Although this scenario occurred in the minority of instances, it is possible that it contributed to the number of VPs used as responses in social interactions.

Because of the low level of initiations and the high level of responses observed in this study, a recommended objective for educational programming and intervention should be to develop the individual's ability to initiate verbal exchanges for a variety of different purposes and under appropriate circumstances. One could argue that initially when working with persons who rarely initiate interactions, any attempt they make, regardless of the content, needs to be rewarded. Only after they have learned how to initiate verbal exchanges and the occurrence of initiations increases, should the content of the initiation be an issue. In other words, by discouraging VPs when used as an initiation, the act of initiating interactions may be discouraged as well as the use of the VP. Educators and parents need to be acutely aware of exactly what behaviors they are affecting when attempting to modify behavior in others.

Data were also presented which documented that unlike VPs, which were generally used for interactive purposes, the majority of NVPs were used for information, usually as a response to other utterances.

One possible explanation for this finding is the nature of the teacher-student relationship. Much of the talking observed throughout the study was in the traditional teacher-student mode. That is, the authoritative adult asked questions and the participant answered them. In such situations, a response, usually an exchange of information, was desired. It appears that the participants were able to carry on the exchange when answering information questions without resorting to VPs. Furthermore, it appears that the teachers did not make an effort to create a social dialogue with the students in these situations. Thus, the nature of the exchange was informative as opposed to interactive.

It appears, then, that by emphasizing question asking for specific information, teachers may inadvertently restrict the development of initiative behavior in a population of persons who manifest little of such behavior (Beisler & Tsai, 1983). This conclusion further supports the notion that teachers need to develop alternative modes of teaching that are conducive to more initiative behavior in students.

Two of the primary characteristics of autism are an impairment in using language communicatively and a difficulty in relating to other persons (Rutter, 1978). However, in this study the participants were found to be surprisingly communicative and social in nature. One probable explanation of this finding pertains to the age and functioning level of the participants. Whereas children with autism who are verbal are often described as having a low level of spontaneous speech and other communicative behavior, paradoxically, many adolescents and adults with autism have been described as talking too much and frequently interacting with others, albeit often inappropriately (Lord & O'Neill, 1983; Mesibov & Shea, 1980). It would appear, then, that the traditional image of the young child with autism has little relevance when discussing the older person with autism. The findings of this study support this notion.

Furthermore, because of the selection criteria used in this study, participants tended to be higher functioning than would a random sample of persons with autism, many of whom manifest little or no communicative language. This clearly affected the degree of communicative behavior observed, since it is widely recognized that the higher functioning person with autism is more apt to be communicative than the lower functioning person with autism (Ricks & Wing, 1975).

On a qualitative note, whether or not VPs were used with communicative intent did not appear to affect the "enjoyment" that the participants seemed to derive from talking about their interest patterns. Observers noted that when speaking to another person, participants often smiled, laughed, or became excited when using VPs. Likewise, when using VPs not directed toward another person, usually talking to oneself, participants also seemed happy and animated. Although there were many individual differences, this was in marked contrast to the general behavior of many of the participants which could best be described as subdued and reserved. Such an observation suggests that participants derive pleasure from their interest patterns and VP use. Parents and teachers, therefore, need to consider the ethical ramifications when attempting to modify such behavior. If the aim of intervention is to decrease the non-communicative use of VPs, it may be desirable not to discourage the interest pattern itself, but to encourage VP use for communicative purposes. Again, how VPs are utilized by the individual needs to be assessed.

Setting

The findings of this study document that both VPs and NVPs occurred most often in work, followed in order of frequency by transition and free-time. Since VPs tended to be used primarily for social interaction, one could anticipate that they would occur more in those settings that are conducive to interactions with other persons, that is, transition, free-time, and snack/lunch. The finding that VPs occurred most often in work for many of the participants has several possible explanations.

The first explanation pertains to the recipients of the verbal utterances. Although the identity of the recipients was not recorded in this study, informal accounts by the observers suggested that relatively few utterances of either type were directed toward peers. In fact, an overwhelming percentage of utterances was directed toward adults without autism, usually the teacher, aide, or work supervisor. Such individuals were more likely to be near the participants in the work setting, while peers were more likely to be nearby during transition, free-time, and snack/lunch.

In other words, a possible reason why VPs and, in fact, all utterances occurred most often in the work setting was because this type of setting was where the desired recipients of the utterance were likely to be. This finding is congruent with the widespread observation that children with autism rarely spontaneously speak to each other, but are more apt to speak to adults (Wing & Gould, 1979). Why this is so and how to increase interactions between peers are issues that need to be examined.

One exception noted in this study was the relationship between participants #11 and #12. According to the observer and the investigator, these were two friends who shared the same interest patterns and clearly talked more to each other than to the teacher or aide. Ironically, the teacher of the participants stated that she deliberately attempted to keep them apart because of their exccessive VPs. As a result, much of their time was spent separated from each other. In those situations when they weren't together, it was observed that each used VPs with other peers rather than with the teacher or aide. Not surprisingly, the VPs of these two participants did not occur most often in work, but rather in transition (#11) and free-time (#12). One can conclude from these data that VPs were generally used by these individuals in unstructured settings to interact with peers, particularly each other. Such a conclusion is encouraging, since it suggests that VPs can be a means to peer interaction. One area that needs to be explored, therefore, is the potential use of VPs in developing peer friendships between persons with autism.

Another explanation why all utterances occurred most often in the work setting pertains to the settings in which the person with autism is most encouraged to talk. It would seem logical that since persons with autism are rarely able to make friends and have difficulty socializing with other persons, especially their peers, social interactions on an informal basis would be encouraged during unstructured times such as transition, free-time, and snack/lunch. In fact, quite the contrary was seen throughout this study. The majority of the participants spent their time in such settings alone. If they were with peers, the participants rarely spoke to them. Surprisingly, staff members generally did not encourage the participants to talk with their peers, and, in fact, often times discouraged social talking. As a result, it is unlikely that many of the participants viewed unstructured settings, such as transition, free-time, and snack/lunch as a "time for talking".

In the work setting, by contrast, the participants were often asked questions by the teacher, aide, or work supervisor, thus encouraging the participants to answer questions, usually related to the task at hand. Ironically, then, as a result of these frequent reciprocal verbal exchanges, the work setting appears to be perceived by the participants as a "time for talking". It can be speculated, then, that because of the environmental factors present in the classroom and work environment, the person with autism feels more comfortable talking during this type of setting. This would explain why most VPs, as well as NVPs, occurred in work.

A related finding is the low number of either type of utterance which occurred during snack/lunch. Many of the participants ate their lunches and snacks in virtual silence. It was noted that some of the participants were actually physically separated from peers and forced to eat alone. In no site observed throughout this study was snack/lunch actively utilized as a setting for teaching purposes. One suggestion is that snack/lunch periods be reevaluated by educational personnel. Such times should be thought of as rich opportunities to teach age-appropriate skills through activities such as requesting utensils, sharing foods, comparing lunches, discussing hygiene, etc.

Another finding of this study was that when comparing mean percentages, VPs tended to be used more often in transition than did NVPs, although the difference did not reach significance. This finding may be explained by examining the nature of the transition setting. All school and work environments observed were basically structured programs, ones in which the participants were more-or-less instructed what to do and when to do it. In those situations, however, where there was no directive from the teacher or work supervisor, participants were forced to draw on their inner resources to function at that particular point in time. Ways in which the participants filled in this time included manipulating objects, rocking, walking about, talking to oneself, and talking to others. By definition, transition refers to those settings in which there was no objective at the time. Therefore, it seems likely that when the participants were in transition and desired to make conversation with others, they did so in ways most accessible to them, that is, by using VPs. The data examining the relationship of communicative intent to setting supports this argument, since it was demonstrated that VPs were used significantly more with communicative intent than without communicative intent in transition (as well as work and free-time).

These data suggest that the participants often resorted to the use of VPs in order to fill "empty" time, since one of the major ways they tended to use such utterances was in settings where there were no directives from others. It appears, then, that VPs serve an adaptive role for many of the participants. Therefore, one suggested objective of educational programming and intervention is to explore strategies that the individual may utilize in functioning in such settings. Examples include checking over work to see if it was done correctly, checking the schedule to see what task is next, asking peers to see their finished products, etc. Clearly, such strategies would be extremely useful for persons with autism throughout their lives.

In summary, it can be concluded that unstructured settings as a whole need to be more effectively utilized in educational and work environments for persons with autism. Instead of thinking of such settings as "dead-time", teachers and work supervisors should explore the potential learning possibilities inherent in such settings, especially in the area of social interactions.

Response of Listener

Evidence was presented which documents the manner in which VPs were responded to by the listener. It was found that both VPs and NVPs were for the most part given a neutral response, followed in frequency by no response. Few positive or negative responses were given to either type of utterance. This pattern of responding was unexpected. It was assumed that since VPs are generally considered to be undesirable and inappropriate, more negative responses would be given.

It is possible that the age of the participants was a factor. Participants were mostly adolescents and adults. In many secondary and adult programs for persons with autism, immediate reinforcement and punishment tend to be phased out in favor of more age-appropriate responses to such behavior, such as neutral responding and ignoring of inappropriate behavior. This appeared to be the general philosophy at most sites observed. Thus, the low amount of negative and positive responses for both VPs and NVPs would seem to be a reflection of the prevailing behavior management philosophy.

However, when comparing mean percentages of occurrence between VPs and NVPs it was found that the former tended to be given no response, while the latter was more apt to be given a neutral response. This finding is congruent with the common notion that VPs are a negative behavior that should be discouraged. As discussed above, this type of utterance was generally ignored, apparently as an attempt at decreasing the behavior. NVPs, on the other hand, were more likely to be given a neutral response. This finding is not surprising since NVPs tended to be used for information, and neutral responses would seem to be the most likely response given in an exchange of information.

Another finding of this study was that although the most common response to VPs was no response, when used with communicative intent, VPs were given significantly more neutral responses than VPs used without communicative intent. This finding is encouraging, suggesting that classroom personnel and work supervisors modify their responses according to the communicative intent of the utterance to some extent. The criteria they use for such an assessment is an issue that needs further examination.

A final finding was that frequency of VP use did not significantly affect how such utterances were responded to by the listener. It can be concluded from these data that classroom personnel and work supervisors do not modify their responses according to the frequency of the behavior. Such a conclusion is surprising, since it could be anticipated that VPs occurring at a relatively high rate would be more irritating to the listener, and thus receive more negative and no responses, than VPs occurring at a relatively medium or low rate. This finding may be related to the content areas of the different interest patterns of the participants. It is likely that some topics of interest (i.e. bathrooms) would be more offensive to the listener than others (i.e. rock 'n' roll music). It appears, then, that areas that need to be explored are the attitudes of family members, teachers, and work supervisors toward frequency of VP use and attitudes toward VPs depending on content area.

The recommendation to be emphasized is that verbal perseverations not be viewed as negative behavior, per se. On the contrary, the data indicate that many individuals use VPs for social interaction. Since persons with autism, by definition, lack an ability to interact appropriately with other persons, a major objective for educational programming and intervention should be to develop the individual's social skills. One way to do so would be to begin with and build on the attempts that the individual is currently making at interaction. At the same time, however, teachers and parents need to assess how the person with autism uses VPs before determining how best to respond to such behavior. An individual who predominantly talks to inanimate objects when using VPs would no doubt need a different response contingency than the individual who uses VPs to initiate or maintain social interaction.

In summary, findings from this investigation provide consistent support for the notion that VPs are used with communicative intent, in particular, as a means of social interaction. Furthermore, basic descriptive data have been collected and can be viewed as the beginning of a knowledge base concerning VPs in persons with autism. Limitations and suggestions for future research will now be discussed.

Limitations and Suggestions for Future Research

There are several limitations of the present study. First, because there is little information available in the literature concerning VPs, one of the purposes of this study was to gather data concerning the parameters surrounding the occurrence of VPs. Because three different variables were examined (setting, response of listener, and function), categories had to be somewhat broad. A suggestion for future research would be to break down each of the categories into finer distinctions. It is possible that by collapsing categories valuable information may have been lost. For example, response of listener could be further broken down into those responses from the intended recipient and those from a person other than the intended recipient. Also, additional variables could be examined, such as identity of the recipient. This may be of particular relevance when VPs are directed toward peers, yet responded to by the teacher. Also, additional variables could be examined, such as identity of the recipient of the utterance and appropriateness of the utterance.

Another limitation concerns the ages of the participants. In this study, ages ranged from 9.1 to 26.0. A recommended aim of future research would be to compare the VPs of different age groups to examine whether there is a developmental factor influencing how such behavior is used by the individual.

A related problem is that in this study the participants were observed during a 1 to 2 month period. To better understand change with maturation and the effects of environmental variables, a long-term longitudinal study of VPs needs to be conducted. Findings of such a study would be essential in better understanding the role that VPs play in the lives of persons with autism.

A final point to be emphasized is that VPs are but one manifestation of circumscribed interest patterns. Future research needs to be done examining other non-verbal ways in which individuals indulge in their interest patterns, including drawing pictures, collecting objects, etc. Furthermore, circumscribed interest patterns are but one manifestation of sameness behavior. Additional reearch needs to be done examining how such interest patterns relate to other aspects of sameness behavior. Such information would contribute greatly to better understanding this perplexing behavior.

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Appendix A

Coding Sheet

Participant ____________ Date ____________ Page ____________

Observer ____________ Start Time ____________ Stop Time ____________

	UTTERANCE			SETTING					FUNCTION Initiation					FUNCTION Response					RESPONSE OF LISTENER				COMMENTS
										Person-Oriented					Person-Oriented								
	U	VP	NVP	HK	FR	TR	SL	O	Non-Pers	Int	Inf	Req	Oth	Non-Pers	Int	Inf	Req	Oth	Pos	Neg	Neu	No	
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Halliday's Socio-Linguistic Categories (1975)

1. Interactional: language used to establish or maintain interpersonal contact ("Good morning.")
2. Personal: language which reflects an awareness of one's individuality ("I like that.")
3. Instrumental: language as a means of getting things done ("Give me the toy.")
4. Regulatory: language used to control one's own or others' behavior ("Tie my shoes.")
5. Informative: language used to convey information ("The car is red.")
6. Heuristic: language as a means of exploring the environment ("What is that?")
7. Imaginative: language used in the realm of play and fantasy (rhyming)

Appendix B

Descriptive Data On Individual Participants

Participant #1

Sex: Male

Age: 13.0

Diagnosis: Tuberous Schlerosis with Autism

Interest Pattern: Cars, primarily BMW's.

Environment: Public school secondary classroom for persons with autism; Teacher/student ratio 3/6.

Language Sample

"Do you have a BMW?" (VP) Interactive

"See the pretty car!" (VP) Regulative

"I like BMW's." (VP) Interactive

"I wish I had a BMW." (VP) Interactive

"The BMW is a moving car, meow, meow." (VP) Non-Person

"What's your name?" (NVP) Interactive

"I love you." (NVP) Interactive

"Please may I have more popcorn?" (NVP) Regulative

"I watched TV last night." (NVP) Informative

"Wendy, shut up mouth!" (NVP) Regulative

Observational Data #1

Utterance Type:	Unintelligible	2%		Total Number:
	VP	11%		3053
	NVP	87%		

Setting:		VP	NVP
	Work	54%	47%
	Free-Time	2%	8%
	Transition	42%	36%
	Snack/Lunch	2%	9%
	Other	0	0

Function:		Initiation		Response	
		VP	NVP	VP	NVP
	Non-Person	11%	6%	0	0
	Interactive	17%	7%	52%	18%
	Informative	7%	12%	12%	52%
	Regulative	0	3%	1%	2%
	Other	0	0	0	0

Response of Listener:		VP	NVP
	Positive	7%	9%
	Negative	1%	1%
	Neutral	56%	63%
	No Response	37%	28%

Informal Observer Comments

Overall Description

Participant #1 was described as a pleasant boy, eager to please and apparently enjoying the company of staff members. He generally ignored his peers.

Interest Pattern and VPs

Participant #1 became noticably excited and happy whenever he saw cars, especially BMW's. Most of his VPs occurred under these situations. Classroom staff members appeared to respond to such behavior indiscriminately, at times ignoring it and at other times mildly encouraging it.

Participant #2

Sex: Male

Age: 19./1

Diagnosis: Autism

Interest Pattern: Cartoons and fantasy figures.

Environment: Public school secondary classroom for persons with autism; Teacher/student ratio 3/4.

Language Sample

"I'm gonna watch Thumper." (VP) Informative

"Here it comes, PacMan." (VP) Non-Person

"Harry, the duck I like." (VP) Interactive

"It's Superman!" (VP) Interactive

"Walt Disney, Walt Disney." (VP) Interactive

"It hurts, bandage." (NVP) Informative

"I want vanilla pudding." (NVP) Informative

"Let's have some snacks." (NVP) Regulative

"You're going to watch 'Quincy'". (NVP) Non-Person

"HiHo Cheez Sticks." (NVP) Interactive

Observational Data #2

Utterance Type:			Total Number:
	Unintelligible	5%	851
	VP	10%	
	NVP	85%	

Setting:		VP	NVP
	Work	55%	82%
	Free-Time	25%	12%
	Transition	16%	4%
	Snack/Lunch	4%	2%
	Other	0	0

Function:		Initiation		Response	
		VP	NVP	VP	NVP
	Non-Person	10%	2%	10%	3%
	Interactive	8%	2%	43%	7%
	Informative	3%	4%	24%	81%
	Regulative	0	0	2%	<1%
	Other	0	0	0	0

Response of Listener:		VP	NVP
	Positive	1%	6%
	Negative	9%	8%
	Neutral	61%	72%
	No Response	29%	14%

Informal Observer Comments

Overall Description

Participant #2 was described as a quiet young man, usually ignoring both staff members and peers.

Interest Pattern and VPs

Participant #2 was preoccupied with cartoons and fantasy figures. He would sometimes utter VPs apparently "out of the blue". At other times they would be tied to environmental happenings (such as seeing a picture of Superman on a cereal box). Two classroom staff members called this type of talking "garbage talk" and tended to discourage it, while one staff member discouraged it at times and mildly encouraged it at other times.

Participant #3

Sex: Male

Age: 20.1

Diagnosis: Autism

Interest Pattern: Things that will kill you.

Environment: Public school secondary classroom for persons with autism; Teacher/student ratio 2/5. Some time spent mainstreamed with nonhandicapped individuals and some time spent in a Sheltered Workshop for the Disabled.

Language Sample

"Bob Hope's a killer." (VP) Interactive

"Did you know babyfood's a killer?" (VP) Interactive

"Aspirin will kill you." (VP) Interactive

"It will kill you." (VP) Non-Person

"I know what will kill you." (VP) Interactive

"What are you talking about?" (NVP) Informative

"Somebody stole my socks." (NVP) Informative

"I say wipe off the table." (NVP) Regulative

"Who is on the floor?" (NVP) Non-Person

"Please don't ask." (NVP) Regulative

Observational Data #3

Utterance Type:	Unintelligible	5%	Total Number:
	VP	3%	742
	NVP	92%	

Setting:		VP	NVP
	Work	29%	62%
	Free-Time	42%	9%
	Transition	25%	27%
	Snack/Lunch	<1%	2%
	Other	0	0

Function:		Initiation		Response	
		VP	NVP	VP	NVP
	Non-Person	17%	4%	0	2%
	Interactive	33%	9%	50%	22%
	Informative	0	<1%	0	52%
	Regulative	0	2%	0	7%
	Other	0	0	0	0

Response of Listener:		VP	NVP
	Positive	4%	13%
	Negative	13%	4%
	Neutral	25%	56%
	No Response	58%	27%

Informal Observer Comments

Overall Description

Participant #3 was a quiet young man, occasionally speaking to both peers and staff members.

Interest Pattern and VPs

Participant #3 was interested in things that will kill. VPs were almost always brought up "out of the blue". It was observed that he had a type of smirk on his face when he uttered VPs, as if he enjoyed the affect his utterance would have on the listener. Staff members generally ignored his VPs, while peers usually responded neutrally.

Participant #4

Sex: Male

Age: 18.4

Diagnosis: Autism

Interest Pattern: (A) Bathroom; (B) Sitting down.

Environment: Public school secondary classroom for persons with autism; Teacher/student ratio 2/6.

Language Sample

"Sit down here?" (VP) Informative

"I want to sit down." (VP) Informative

"After lunch bathroom." (VP) Interactive

"I want bathroom." (VP) Informative

"Yes, bathroom please." (VP) Interactive

"Play ball." (NVP) Informative

"Hit, no hit." (NVP) Non-Person

"Outside go." (NVP) Interactive

"Open applesauce please." (NVP) Regulative

"No run." (NVP) Informative

Observational Data #4

Utterance Type:	Unintelligible	9%	Total Number: 1098
	VP	32%	
	NVP	59%	

Setting:		VP	NVP
	Work	42%	51%
	Free-Time	24%	17%
	Transition	33%	30%
	Snack/Lunch	1%	2%
	Other	0	0

Function:		Initiation		Response	
		VP	NVP	VP	NVP
	Non-Person	4%	3%	2%	1%
	Interactive	10%	2%	39%	17%
	Informative	13%	4%	30%	72%
	Regulative	0	<1%	2%	<1%
	Other	0	0	0	0

Response of Listener:		VP	NVP
	Positive	1%	5%
	Negative	4%	1%
	Neutral	67%	74%
	No Response	28%	20%

Informal Observer Comments

Overall Description

Participant #4 was the lowest functioning of the participants. He spoke only to staff members, never to peers. Much of his time was spent sitting by himself, moaning and rocking.

Interest Pattern and VPs

Participant #4 appeared to be preoccupied with sitting down and bathrooms because his favorite activities were playing in the bathroom and sitting by himself moaning. Staff members usually responded to his VPs by commenting on them (VP - "Bathroom after lunch." Response - "Do you want to go to the bathroom after lunch?").

Participant #5

Sex: Female

Age: 13.5

Diagnosis: Cerebral Palsy with Autism

Interest Pattern: Quality of her behavior.

Environment: Public school secondary classroom for persons with autism; Teacher/student ratio 3.6.

Language Sample

"I am being good." (VP) Interactive

"I did not good, be good." (VP) Interactive

"No check mark, not good." (VP) Informative

"I'm calm now." (VP) Interactive

"See I'm quiet now." (VP) Interactive

"Please wait." (NVP) Regulative

"Push me." (NVP) Regulative

"I like salt." (NVP) Interactive

"Let's go." (NVP) Non-Person

"I watch TV." (NVP) Informative

Observational Data #5

Utterance Type:			Total Number:
	Unintelligible	2%	4030
	VP	24%	
	NVP	74%	

Setting:		VP	NVP
	Work	47%	57%
	Free-Time	11%	21%
	Transition	13%	11%
	Snack/Lunch	1%	10%
	Other	28%	1%

Function:		Initiation		Response	
		VP	NVP	VP	NVP
	Non-Person	2%	4%	18%	3%
	Interactive	10%	16%	65%	51%
	Informative	1%	5%	3%	19%
	Regulative	0	1%	<1%	1%
	Other	0	0	0	0

Response of Listener:		VP	NVP
	Positive	3%	3%
	Negative	1%	4%
	Neutral	40%	56%
	No Response	53%	37%

Informal Observer Comments

Overall Description

Participant #5 was a talkative girl, generally directing her speech to staff members, rarely to peers. Staff members described her as a "behavior problem" needing constant supervision. When left on her own she would bother others by grabbing, pinching, being loud, etc.

Interest Pattern and VPs

Participant #5 appeared to be insecure, often needing reassurance from staff members that she was doing alright. Her VPs dealt with the quality of her behavior, questioning or commenting on whether it was good or bad. The listener either ignored such utterances or responded by reassuring her that her behavior was adequate, or, conversely, explaining to her how she could improve.

Participant #6

Sex: Male

Age: 20.0

Diagnosis: Autism with Schizophrenic Thought Disorder

Interest Pattern: (A) Church things; (B) Pythons.

Environment: Public school secondary classroom for persons with autism; Teacher/student ratio 2/5. Some time spent mainstreamed with nonhandicapped individuals and some time spent in a Sheltered Workshop for the Disabled.

Language Sample

"They throw rocks in the Bible." (VP) Interactive

"Jesus drinks apple juice." (VP) Interactive

"I went as a priest for Halloween." (VP) Informative

"The python is big and will choke you hard." (VP) Interactive

"Get away from the snake before it gets you." (VP) Non-Person

"I wasn't laughing, oh no." (NVP) Informative

"What did he say?" (NVP) Informative

"I'll be careful." (NVP) Interactive

"'Stray Cats' are popular." (NVP) Interactive

Observational Data #6

Utterance Type:	Unintelligible	12%	Total Number:
	VP	8%	1548
	NVP	80%	

Setting:		VP	NVP
	Work	3%	40%
	Free-Time	12%	17%
	Transition	78%	38%
	Snack/Lunch	7%	5%
	Other	0	0

Function:		Initiation		Response	
		VP	NVP	VP	NVP
	Non-Person	2%	5%	6%	7%
	Interactive	6%	4%	75%	45%
	Informative	1%	<1%	10%	36%
	Regulative	0	<1%	0	2%
	Other	0	0	0	0

Response of Listener:		VP	NVP
	Positive	2%	5%
	Negative	1%	1%
	Neutral	61%	63%
	No Response	36%	31%

Informal Observer Comments

Overall Description

Participant #6 was described as a compliant young man, apparently eager to please. He genuinely seemed to want to interact with others, particularly staff members. While conversing, he would ramble on and on, often laughing to himself.

Interest Pattern and VPs

Participant #6 seemed to have church things and pythons stored in his mind, ready to bring up these topics while he was in the middle of a social interaction. The listener generally responded by commenting on the topic and then trying to redirect the conversation.

Participant #7

Sex: Male

Age: 26.7

Diagnosis: Autism

Interest Pattern: Numbers, primarily dates.

Environment: Workshop for adults with autism;
Supervisor/employee ratio 10/24.

Language Sample

"I see 2, 3, 4." (VP) Non-Person

"What date did you start here?" (VP) Informative

"That song came out in January, 1977," (VP) Interactive

"1965, 1971, 1984." (VP) Non-Person

"I should have been 36 a long time ago." (VP) Non-Person

"He said I could finish now." (NVP) Informative

"How are you?" (NVP) Interactive

"What happened?" (NVP) Informative

"Yeah, I feel bad today." (NVP) Informative

"It's too bad you're so tired." (NVP) Interactive

Observational Data #7

Utterance Type:	Unintelligible	12%	Total Number:
	VP	18%	1803
	NVP	70%	

Setting:		VP	NVP
	Work	51%	48%
	Free-Time	1%	8%
	Transition	47%	42%
	Snack/Lunch	1%	2%
	Other	0	0

Function:		Initiation		Response	
		VP	NVP	VP	NVP
	Non-Person	45%	7%	<1%	<1%
	Interactive	3%	4%	30%	23%
	Informative	6%	11%	16%	53%
	Regulative	0	2%	<1%	<1%
	Other	0	0	0	0

Response of Listener:		VP	NVP
	Positive	0	<1%
	Negative	0	<1%
	Neutral	47%	73%
	No Response	53%	26%

Informal Observer Comments

Overall Description

Participant #7 was a likable young man, appearing to desperately want to be liked by staff members. He usually ignored peers, but on several occasions was observed carrying on an appropriate, albeit stilted, conversation with a peer.

Interest Pattern and VPs

Participant #7 was preoccupied with numbers, in particular dates. Most VPs were mumbled to himself or used socially when conversing with others. When spoken to himself, VPs were ignored by others. When spoken to others within a social interaction, they were responded to neutrally.

Participant #8

Sex: Male

Age: 9.1

Diagnosis: Autism

Interest Pattern(s): (A) *Favorite foods*; (B) *Spelling words*.

Environment: Public school elementary classroom for persons with autism and Severe Emotional Disturbance; Teacher/student ratio 2 or 3/4.

Language Sample

"Dennison's is my *favorite stew*." (VP) Interactive

"What's your *favorite applesauce*?" (VP) Interactive

"My *favorite toothpaste* is Crest." (VP) Interactive

"Ball is *b-a-l-l*." (VP) Non-Person

"California, *C-a-l*, *C-a-l*." (VP) Interactive

"I want to earn a hug." (NVP) Informative

"Too much salt." (NVP) Informative

"I saw a cat." (NVP) Non-Person

"Monday is a lovely day." (NVP) Interactive

"Clean up." (NVP) Non-Person

Observational Data #8

Utterance Type:	Unintelligible	8%	Total Number:
	VP	12%	2083
	NVP	80%	

Setting:		VP	NVP
	Work	31%	68%
	Free-Time	9%	8%
	Transition	10%	3%
	Snack/Lunch	50%	21%
	Other	0	0

Function:		Initiation		Response	
		VP	NVP	VP	NVP
	Non-Person	4%	4%	9%	6%
	Interactive	7%	3%	62%	46%
	Informative	0	2%	15%	40%
	Regulative	0	0	0	9%
	Other	3%	0	0	0

Response of Listener:		VP	NVP
	Positive	2%	8%
	Negative	10%	10%
	Neutral	63%	67%
	No Response	25%	15%

Informal Observer Comments

Overall Description

Participant #8 was the youngest individual in this study. He ignored peers, although spoke often to classroom personnel. Staff members described him as a "behavior problem" needing constant supervision. Inappropriate behaviors included scratching, running away, destroying materials, etc.

Interest Pattern and VPs

Participant #8 often talked about topics that were not part of the current conversation when interacting with others. Two of his most common interests were favorite foods and spelling words. The two aides usually responded by redirecting the conversation, while the teacher would verbally discourage the VP.

Participant #9

Sex: Male

Age: 25.9

Diagnosis: Autism

Interest Pattern(s): (A) Diet, nutrition; (B) Music.

Environment: Workshop of adults with autism;
Supervisor/employee ratio 10/24.

Language Sample

"I like songs from the sixties." (VP) Interactive

"Eating garbage gives you bad germs." (VP) Interactive

"I eat nothing but nutritious foods." (VP) Non-Person

"Too much candy will make you go to the hospital." (VP) Interactive

"Do you like the 'Carpenters'?" (VP) Interactive

"I'm getting out of the way." (NVP) Informative

"What's your name?" (NVP) Interactive

"I like to play in sand dunes." (NVP) Interactive

"Time to go soon." (NVP) Non-Person

"I won't be inappropriate anymore." (NVP) Informative

Observational Data #9

Utterance Type:	Unintelligible	2%	Total Number:
	VP	21%	2250
	NVP	77%	

Setting:		VP	NVP
	Work	15%	44%
	Free-Time	33%	28%
	Transition	47%	26%
	Snack/Lunch	4%	2%
	Other	0	0

Function:		Initiation		Response	
		VP	NVP	VP	NVP
	Non-Person	6%	2%	<1%	1%
	Interactive	9%	5%	77%	43%
	Informative	2%	8%	6%	40%
	Regulative	0	1%	0	<1%
	Other	0	0	0	0

Response of Listener:		VP	NVP
	Positive	1%	1%
	Negative	1%	1%
	Neutral	86%	81%
	No Response	4%	17%

Informal Observer Comments

Overall Description

Participant #9 was a pleasant young man who appeared to enjoy talking to staff members, and occasionally peers. When he spoke to staff members he appeared relaxed and eager to please. When he spoke to peers he appeared uncomfortable and unsure of himself. This investigator was informed that he could become violent when he became upset, however, such was not observed during this study.

Interest Pattern and VPs

Participant #9 was on a special diet because of a health problem, which appears to be the reason why he was obsessed with diet and nutrition. His other interest pattern pertained to music, in particular rock 'n' roll songs from the 50's and 60's. The observer stated that VPs appeared to be used in order to "get attention." However, VPs were used most often as responses within a social interaction suggesting that they were used not so much to "get" attention, but rather to "keep" the attention. Almost all VPs were responded to neutrally.

Participant #10

Sex: Female

Age: 20.6

Diagnosis: Autism, Residual State, with Schizophrenic Thought Disorder.

Interest Pattern(s): (A) Them vs. Me; (B) Science Fiction.

Environment: Workshop for adults with autism; Supervisor/employee ratio 10/24.

Language Sample

"They don't treat me fair because I'm a woman."
(VP) Non-Person

"You don't understand my problems." (VP) Interactive

"You think I'm a baby." (VP) Interactive

"I wish I was from outer space." (VP) Non-Person

"Luke Skywalker is so good-looking." (VP) Interactive

"I'm a talking teen-ager." (NVP) Interactive

"How about a kiss?" (NVP) Interactive

"What sign were you born under?" (NVP) Informative

"I like sea planes." (NVP) Interactive

"Better to work for a little money than no money."
(NVP) Non-Person

Observational Data #10

Utterance Type:	Unintelligible	3%	Total Number:
	VP	19%	2462
	NVP	78%	

Setting:		VP	NVP
	Work	60%	42%
	Free-Time	13%	19%
	Transition	21%	32%
	Snack/Lunch	6%	7%
	Other	0	0

Function:		Initiation		Response	
		VP	NVP	VP	NVP
	Non-Person	14%	8%	15%	10%
	Interactive	10%	4%	52%	44%
	Informative	0	2%	7%	25%
	Regulative	<1%	1%	2%	6%
	Other	0	0	0	0

Response of Listener:		VP	NVP
	Positive	1%	1%
	Negative	1%	3%
	Neutral	44%	59%
	No Response	54%	37%

Informal Observer Comments

Overall Description

Participant #10 was quite different from the other participants in this study. She was extremely verbal and social, usually to staff members. She would even tease and joke with them, a behavior rarely seen in the other participants. Unfortunately, she would get upset easily and often had to be punished by being put on "structured time", which meant she could not speak a word to anyone.

Interest Pattern and VPs

Participant #10 seemed to have a "persecution complex", in that whenever she was mildly reprimanded or criticized, she would whine and complain that nobody cared about her or nobody understood her problems. She blamed this on being a woman. Staff members usually responded to these VPs by stating why she was wrong or ignoring her. On a number of occasions they appeared to be so irritated with her whining that they ridiculed her ("Do you hear yourself talking? You should be locked up." "You are really weird."). Her other interest pattern pertained to science fiction. Such utterances tended to be responded to neutrally or ignored, and were often muttered to herself.

Participant #11

Sex: Male

Age: 14.6

Diagnosis: Autism

Interest Pattern(s): (A) Freeways, with streets, exits and gas stations along the way; (B) TV shows.

Environment: Public school secondary classroom for persons with autism; Teacher/student ratio 3/6. Some time spent mainstreamed with nonhandicapped individuals and some time spent in a Sheltered Workshop for the Disabled.

Language Sample

"I like 'Mary Tyler Moore' show." (VP) Interactive
"What program do you watch on channel 4?" (VP) Interactive
"Did you see the Arco on Firside Street?" (VP) Interactive
"Highway 99 goes up and down, up and down." (VP) Non-Person
"I hate 101, it goes nowhere." (VP) Non-Person

"I made that basket." (NVP) Interactive
"Do you like Punk music?" (NVP) Interactive
"I'm finished." (NVP) Informative
"I can't find my pencil." (NVP) Informative
"Is it time for lunch yet?" (NVP) Informative

Observational Data #11

Utterance Type:			Total Number:
	Unintelligible	6%	3523
	VP	13%	
	NVP	81%	

Setting:		VP	NVP
	Work	22%	51%
	Free-Time	14%	18%
	Transition	55%	23%
	Snack/Lunch	9%	8%
	Other	0	0

Function:		Initiation		Response	
		VP	NVP	VP	NVP
	Non-Person	1%	7%	5%	7%
	Interactive	6%	8%	76%	37%
	Informative	2%	4%	7%	31%
	Regulative	0	1%	3%	4%
	Other	0	0	0	<1%

Response of Listener:		VP	NVP
	Positive	1%	1%
	Negative	1%	<1%
	Neutral	80%	56%
	No Response	19%	43%

Informal Observer Comments

Overall Description

Participant #11 was a talkative adolescent, who spoke often to classroom personnel and peers. He and participant #12 were the only friendship dyad included in this study. Furthermore, they were the strongest friendship dyad seen at any of the sites observed.

Interest Pattern and VPs

Participant #11 manifested two interest patterns: freeways, their exits, and stops along the way; and TV shows. He used VPs pertaining to these themes primarily as a response in a social interaction. He clearly preferred to talk to Participant #12. However, the teacher tried to keep the two apart because of their excessive VPs. When participant #12 was not near-by, participant #11 would direct his VPs to other peers, never to staff members. Such utterances seemed to be enjoyed by peers and were usually responded to neutrally.

Participant #12

Sex: Male

Age: 17.6

Diagnosis: Autism

Interest Pattern(s): (A) Freeways, with streets, exists, and gas stations along the way; (B) TV shows.

Environment: Public school secondary classroom for persons with autism; Teacher/student ratio 3/6. Some time spent mainstreamed with nonhandicapped individuals and some time spent in a Sheltered Workshop for the Disabled.

Language Sample

"I never miss 'Merv Griffin'." (VP) Interactive

"'Jeopardy' is the best." (VP) Non-Person

"'Sesame Street' is on 7 days." (VP) Interactive

"Which freeway to get to Las Vegas?" (VP) Non-Person

"The Chevron station is so funny, funny." (VP) Interactive

"I want to go home." (NVP) Informative

"Baking with an oven is crazy." (NVP) Non-Person

"Don't get mad, OK?" (NVP) Regulative

"I need a good occupation." (NVP) Non-Person

"Where is everybody?" (NVP) Informative

Observational Data #12

Utterance Type:				Total Number:
	Unintelligible	7%		2911
	VP	35%		
	NVP	58%		

Setting:		VP	NVP
	Work	26%	56%
	Free-Time	34%	24%
	Transition	24%	16%
	Snack/Lunch	16%	4%
	Other	0	0

Function:		Initiation		Response	
		VP	NVP	VP	NVP
	Non-Person	11%	8%	34%	17%
	Interactive	3%	5%	42%	28%
	Informative	<1%	5%	5%	35%
	Regulative	<1%	<1%	4%	2%
	Other	1%	0	0	0

Response of Listener:		VP	NVP
	Positive	1%	1%
	Negative	3%	2%
	Neutral	44%	58%
	No Response	53%	39%

Informal Observer Comments

Overall Description

Participant #12 was a talkative adolescent, who spoke often to classroom personnel and peers. He was the second half of the friendship dyad described for participant #11.

Interest Pattern and VPs

Participant #12 manifested the same two interest patterns as Participant #11: freeways, their exits, and stops along the way; and TV shows. Although it is not known which participant manifested these interests first, the observer noted that Participant #11 appeared to be the "leader" in determining the conversation at hand, while Participant #12 was the "follower". Participant #12 had the highest percentage of VPs seen in this study (35%). He used them equally to talk to peers, especially Participant #11, and to mumble to himself. In the former case they appeared to be an effective means to social interaction, while in the latter case they were usually not heard by others, and thus received no response.

Consecutive utterances between Participants #11 and #12, 2 apparent friends (much giggling and touching) both having the same circumscribed interest patterns; Freeways, streets, exits and gas stations along the way; and TV shows.

Participant #11: "_____, is it Chevron?"

Participant #12: "Do you love '*Joker's Wild*'?"

Participant #11: "_____, I forgot, is it *Mobil* on *Hill*?"

Participant #12: "*Mobil*. Do you like video?"

Participant #11: "What does *Standard* look like?"

Participant #12: "It looks like orange. Do you like orange?"

Participant #11: "I like orange and tomato."

Participant #12: "_____, 632, what *street*?"

Participant #11: "Do you love *Standard*?"

Participant #12: "No, I love *Chevron*."

Participant #11: "You love the *gas station* that goes dududu."
"Please say *Standard*."

Participant #12: "No."

Participant #11: "The only state highway you love is 99."

Participant #12: "I don't love 99."

Participant #13

Sex: Male

Age: 20.7

Diagnosis: Autism

Interest Pattern(s): (A) Music; (B) Birthdates.

Environment: Public school secondary classrooms for persons with different handicaps, not self-contained; Average teacher/student ratio 1/10.

Language Sample

"When were you born?" (VP) Informative

"I remember your birthday." (VP) Interactive

"I like rock and roll." (VP) Interactive

"Elton John has a good song out." (VP) Interactive

"Rock music is louder than classical." (VP) Non-Person

"I'd like to get a new train." (NVP) Interactive

"Have you been here before?" (NVP) Informative

"I'm not too good at this." (NVP) Non-Person

"Good afternoon." (NVP) Interactive

"I am here." (NVP) Informative

Observational Data #13

Utterance Type:	Unintelligible	2%	Total Number:
	VP	14%	2024
	NVP	84%	

Setting:		VP	NVP
	Work	56%	55%
	Free-Time	28%	24%
	Transition	14%	20%
	Snack/Lunch	0	<1%
	Other	2%	1%

Function:		Initiation		Response	
		VP	NVP	VP	NVP
	Non-Person	4%	4%	2%	1%
	Interactive	9%	6%	53%	35%
	Informative	5%	9%	27%	43%
	Regulative	0	1%	<1%	2%
	Other	0	0	0	<1%

Response of Listener:		VP	NVP
	Positive	0	1%
	Negative	2%	<1%
	Neutral	83%	86%
	No Response	15%	13%

Informal Observer Comments

Overall Description

Participant #13 was a pleasant young man, who usually talked to staff members but tended to ignore peers. This investigator was informed that he could become violent when he became upset, however, such was not observed during this study.

Interest Pattern and VPs

Participant #13 manifested two interest patterns: music and birth dates. Few VPs were used non-communicatively. The majority were used as responses in social interactions and approximately a fourth were used as responses in an exchange of information. The listener generally did not seem to mind these VPs and almost always responded neutrally.

Participant #14

Sex: Male

Age: 16.6

Diagnosis: Autism with Schizophrenic Thought Disorder

Interest Pattern(s); (A) Girls; (B) Smoking.

Envinronment: Public school secondary classroom for persons with autism; Teacher/student ratio 2/6. Some time spent mainstreamed with nonhandicapped individuals and some time spent in a Sheltered Workshop for the Disabled.

Language Sample

"Valerie wants to go out with me." (VP) Interactive
"Do you think Kathy is pretty?" (VP) Interactive
"She's 18, too old for me." (VP) Interactive
"Smoking causes cancer." (VP) Interactive
"Do you ever smoke, even a little?" (VP) Informative

"I don't want them to think I'm retarded." (NVP) Informative
"I feel depressed." (NVP) Informative
"I went to Magic Mountain." (NVP) Interactive
"I've never been to Columbus." (NVP) Interactive
"I really get mad." (NVP) Non-Person

Observational Data #14

Utterance Type:	Unintelligible	8%	Total Number:
	VP	10%	1871
	NVP	82%	

Setting:		VP	NVP
	Work	39%	70%
	Free-Time	21%	16%
	Transition	33%	12%
	Snack/Lunch	7%	2%
	Other	0	0

Function:		Initiation		Response	
		VP	NVP	VP	NVP
	Non-Person	1%	1%	1%	2%
	Interactive	9%	8%	81%	39%
	Informative	0	1%	9%	49%
	Regulative	0	0	0	<1%
	Other	0	0	0	0

Response of Listener:		VP	NVP
	Positive	1%	1%
	Negative	0	<1%
	Neutral	86%	85%
	No Response	13%	11%

Informal Observer Comments

Overall Description

Participant #14 was one of the highest functioning of the sample. He was attractive, manifesting no bizarre mannerisms. He tended not to want to associate with peers from his autism class when nonhandicapped peers were around, preferring their company. He stated on several occasions, "I don't want them to think I'm retarded."

Interest Pattern and VPs

The interest patterns of participant #14 (girls and smoking) were the most age-appropriate of those seen in this study. The vast majority appeared to be used to maintain a social conversation with nonhandicapped peers, followed in order by staff members and peers from his autism class. Most responses were neutral in nature.

Participant #15

Sex: Male

Age: 14.1

Diagnosis: Autism

Interest Pattern(s): Mr. Woods and water heaters.

Environment: Public school secondary classroom for persons with autism; Teacher/student ratio 3/6.

Language Sample

"Papa's better than Mr. Woods." (VP) Non-Person
"No water heaters for Mr. Woods." (VP) Interactive
"I hate Mr. Woods." (VP) Interactive
"I will find the water heater." (VP) Interactive
"Mr. Woods hates me." (VP) Non-Person

"I'll get all this stuff." (NVP) Informative
"I'm teasing." (NVP) Interactive
"I feel like to say OK." (NVP) Informative
"Giving me a hug." (NVP) Regulative
"I feel jealous." (NVP) Informative

Observational Data #15

Utterance Type:	Unintelligible	3%	Total Number: 2945
	VP	22%	
	NVP	75%	

Setting:		VP	NVP
	Work	79%	75%
	Free-Time	15%	15%
	Transition	3%	6%
	Snack/Lunch	3%	4%
	Other	0	0

Function:		Initiation		Response	
		VP	NVP	VP	NVP
	Non-Person	8%	4%	4%	1%
	Interactive	7%	8%	78%	41%
	Informative	<1%	5%	1%	36%
	Regulative	0	1%	2%	4%
	Other	0	0	0	0

Response of Listener:		VP	NVP
	Positive	1%	3%
	Negative	1%	1%
	Neutral	34%	80%
	No Response	65%	19%

Informal Observer Comments

Overall Description

Participant #15 was described as an emotionally labile adolescent, often appearing to be unhappy. He frequently spoke to staff members, rarely to peers.

Interest Pattern and VPs

Participant #15 was preoccupied with Mr. Woods (a former teacher) and water heaters, two concepts usually tied together. He appeared to use VPs in work situations when he felt pressured or confused. The teacher and aide usually ignored such utterances.

Appendix C

Function Data

Data were collected on all of the functions with which both VPs and NVPs were used. These data will now be reported. All verbal utterances were coded with one of the following functions: initiation non-person, initiation interactive, initiation informative, initiation regulative, initiation other, response non-person, response interactive, response informative, response regulative, or response other. Data for both VPs and NVPs are summarized in Table 31. The data for VPs may be found in Tables 32 and 33 and are reported as frequencies and percentages of total number of VPs. The data for NVPs may be found in Tables 34 and 35 and are reported as frequencies and percentages of total number of NVPs.

Table 31

Means and Standard Deviations of VPs and NVPs Across Functions

Function	Initiation						Response						Combined					
	VP		NVP		Total		VP		NVP		Total		VP		NVP		Total	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
Non-Communicative Intent:																		
Non-Person	9	11	5	2	7	6	7	9	4	5	6	7	16	14	9	6	13	9
Communicative Intent:																		
Interactive	10	7	6	3	8	4	58	16	33	13	46	14	68	17	39	15	54	14
Informative	3	4	5	4	4	3	11	9	44	16	28	12	14	12	49	17	32	14
Regulative	<1	1	1	1	<1	<1	1	1	2	2	2	1	1	1	3	3	2	2
Other	<1	1	0	0	<1	<1	0	0	<1	1	<1	<1	<1	<1	<1	<1	<1	<1
Total:	22	14	16	6	19	9	78	14	84	6	81	9	100	100	100	100	100	100

Note. Percentage of utterance per participant was calculated by dividing the number of each type of utterance (VP or NVP) occurring in each function category for that participant by the total number of the same type of utterance (VP or NVP) for that participant. Mean percentage of VPs and NVPs occurring in each function category was calculated by adding all of the percentages of utterances for each function category and each type of utterance and dividing the total by the number of participants.

Table 32

Frequencies and Percentages for Initiation Functions of VPs

	Non-Person		Interactive		Informative		Regulative		Other		Total
1	35	(11%)	56	(17%)	24	(7%)	0	(0%)	0	(0%)	115
2	9	(10%)	7	(8%)	3	(3%)	0	(0%)	0	(0%)	19
3	4	(17%)	8	(33%)	0	(0%)	0	(0%)	0	(0%)	12
4	15	(4%)	35	(10%)	46	(13%)	0	(0%)	0	(0%)	96
5	20	(2%)	99	(10%)	13	(1%)	0	(0%)	0	(0%)	132
6	3	(2%)	7	(6%)	1	(1%)	0	(0%)	0	(0%)	11
7	147	(45%)	10	(3%)	19	(6%)	0	(0%)	0	(0%)	176
8	9	(4%)	19	(7%)	0	(0%)	0	(0%)	8	(3%)	36
9	30	(6%)	41	(9%)	8	(2%)	0	(0%)	0	(0%)	79
10	66	(14%)	47	(10%)	0	(0%)	1	(<1%)	0	(0%)	114
11	7	(1%)	30	(6%)	9	(2%)	0	(0%)	0	(0%)	46
12	115	(11%)	27	(3%)	5	(<1%)	3	(<1%)	10	(1%)	160
13	11	(4%)	27	(9%)	15	(5%)	0	(0%)	0	(0%)	53
14	1	(1%)	16	(9%)	0	(0%)	0	(0%)	0	(0%)	17
15	52	(8%)	43	(7%)	1	(<1%)	0	(0%)	0	(0%)	96
Total	524		472		144		4		18		1162
Mean Percentage		9.9%		9.8%		2.67%		<1%		<1%	100%
SD	11		7		4			<1	1		

Table 33

Frequencies and Percentages for Response Functions of VPs

	Non-Person		Interactive		Informative		Regulative		Other		Total
1	0	(0%)	168	(52%)	38	(12%)	1	(<1%)	0	(0%)	207
2	9	(10%)	38	(43%)	21	(24%)	2	(2%)	0	(0%)	70
3	0	(0%)	12	(50%)	0	(0%)	0	(0%)	0	(0%)	12
4	6	(2%)	138	(39%)	107	(30%)	5	(2%)	0	(0%)	256
5	175	(18%)	637	(65%)	32	(3%)	1	(<1%)	0	(0%)	845
6	8	(6%)	91	(75%)	12	(10%)	0	(0%)	0	(0%)	111
7	1	(<1%)	99	(30%)	52	(16%)	1	(<1%)	0	(0%)	153
8	24	(9%)	157	(62%)	27	(15%)	0	(0%)	0	(0%)	208
9	2	(<1%)	367	(77%)	29	(6%)	0	(0%)	0	(0%)	398
10	69	(15%)	242	(52%)	30	(7%)	8	(2%)	0	(0%)	349
11	22	(5%)	355	(76%)	33	(7%)	14	(3%)	0	(0%)	424
12	340	(34%)	427	(42%)	50	(5%)	36	(4%)	0	(0%)	853
13	5	(2%)	154	(53%)	79	(27%)	1	(<1%)	0	(0%)	239
14	1	(1%)	148	(81%)	17	(9%)	0	(0%)	0	(0%)	166
15	27	(4%)	509	(78%)	9	(1%)	13	(2%)	0	(0%)	558
Total	689		3542		536		82		0		4849
Mean Percentage		7.07%		58.33%		11.47%		1%			100%
SD	9		16		9			1			

Table 34

Frequencies and Percentages for Initiation Functions of NVPs

	Non-Person		Interactive		Informative		Regulative		Other		Total
1	164	(6%)	179	(7%)	330	(12%)	70	(3%)	0	(0%)	743
2	18	(2%)	16	(2%)	29	(4%)	0	(0%)	0	(0%)	63
3	30	(4%)	60	(9%)	3	(<1%)	14	(2%)	0	(0%)	107
4	17	(3%)	14	(2%)	26	(4%)	2	(<1%)	0	(0%)	59
5	119	(4%)	470	(16%)	148	(5%)	22	(1%)	0	(0%)	759
6	66	(5%)	51	(4%)	3	(<1%)	4	(<1%)	0	(0%)	124
7	92	(7%)	52	(4%)	135	(11%)	24	(2%)	0	(0%)	303
8	65	(4%)	45	(3%)	24	(2%)	0	(0%)	0	(0%)	134
9	40	(2%)	95	(5%)	132	(8%)	16	(1%)	0	(0%)	283
10	152	(8%)	80	(4%)	34	(2%)	15	(1%)	0	(0%)	281
11	184	(7%)	223	(8%)	125	(4%)	35	(1%)	0	(0%)	567
12	138	(8%)	83	(5%)	79	(5%)	8	(<1%)	0	(0%)	308
13	71	(4%)	105	(6%)	147	(9%)	17	(1%)	0	(0%)	340
14	22	(1%)	116	(8%)	19	(1%)	0	(0%)	0	(0%)	157
15	80	(4%)	178	(8%)	115	(5%)	16	(1%)	0	(0%)	389
Total	1258		1767		1349		243		0		4617
Mean Percentage		4.60%		6.06%		4.8%		.87%			100%
SD	2		3		4			1	0		

Table 35

Frequencies and Percentages for Respone Functions of NVPs

	Non-Person		Interactive		Informative		Regulative		Other		Total
1	0	(0%)	467	(18%)	1388	(52%)	60	(2%)	0	(0%)	1915
2	20	(3%)	49	(7%)	589	(81%)	2	(<1%)	0	(0%)	660
3	17	(2%)	153	(22%)	356	(52%)	51	(7%)	0	(0%)	577
4	9	(1%)	110	(17%)	470	(72%)	3	(<1%)	0	(0%)	592
5	104	(3%)	1527	(51%)	574	(19%)	31	(1%)	0	(0%)	2236
6	87	(7%)	561	(45%)	450	(36%)	22	(2%)	0	(0%)	1120
7	3	(<1%)	288	(23%)	664	(53%)	6	(<1%)	0	(0%)	961
8	93	(6%)	773	(46%)	662	(40%)	9	(1%)	0	(0%)	1537
9	15	(1%)	741	(43%)	690	(40%)	7	(<1%)	0	(0%)	1453
10	197	(10%)	849	(44%)	488	(25%)	110	(6%)	0	(0%)	1644
11	198	(7%)	1069	(37%)	882	(31%)	127	(4%)	9	(<1%)	2285
12	280	(17%)	473	(28%)	593	(35%)	36	(2%)	0	(0%)	1382
13	13	(1%)	595	(35%)	731	(43%)	28	(2%)	2	(<1%)	1369
14	27	(2%)	599	(39%)	753	(49%)	5	(<1%)	0	(0%)	1384
15	23	(1%)	914	(41%)	802	(36%)	78	(4%)	0	(0%)	1817
Total	1086		9168		10092		575		11		20932
Mean Percentage		4.07%		33.07%		44.27%		2.07%		<1%	100%
SD	5		13		16			2		<1	